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ABSTRACT

In order to determine the relationship between economic concerns and teachers' reasons for leaving a position, this study investigated several economic concerns, postulated to be related to teacher withdrawal. The rationale for study assumed that withdrawal from a teaching position is determined by four economic, or wage criteria including cost of living, intra-comparability of wages, and ability to pay. Twenty-four public school districts in Maryland, eight of which were considered metropolitan and sixteen of which were considered non-metropolitan in nature were studied for 10 years. Data for all the variables were gathered from each of 24 school districts and statistically analyzed through a multiple linear regression computer program. Conclusions indicating the effect of each variable upon teacher withdrawal are presented. Appendixes and an extensive bibliography are included. (Author/MJM)

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ABSTRACT

Title of Thesis: An Investigation of the Relationship Between a Set of Economic Concerns and Teacher Withdrawal in the State of Maryland From 1960 to 1970

Jerome James Ryscavage, Jr., Doctor of Philosophy, 1972

Thesis directed by: Professor James A. van Zwoll

Introduction

A review of the literature shows that inadequate remuneration is often given as a prime reason for leaving a teaching position, however, little information is available which shows in an objective fashion the relationship between economic concerns and withdrawal of public school teachers. This study investigated several economic concerns, or criteria, postulated to be related to teacher withdrawal.

Problem

The problem posed through this study is to develop an objective way of measuring the relation between selected economic criteria and teacher withdrawal. Integral to this problem is the determination of the equity and adequacy of the financial remuneration of teachers through the use of the economic criteria selected. In addition, because of the nature of the population in this study (i.e., the State of Maryland), a comparison of the relationship was made for metropolitan and non-metropolitan school districts.

Design

The population was comprised of the 24 public school districts in the State of Maryland, eight of which were considered metropolitan

and sixteen of which were considered non-metropolitan in nature. The time dimension for this study involved the ten school years from 1960-61 to 1969-70.

The rationale for the study postulated that withdrawal from a teaching position is determined by four economic, or wage, criteria including cost of living, intra-comparability of wages, inter-comparability of wages, and ability to pay (the independent variables). The following economic proxy variables were identified to represent the wage criteria in measurable units: 1. Cost of living; a. Average salary, year $t-1$, b. Average salary, year t, c. Consumer Price Index, year $t-1$, d. Consumer Price Index, year t . 2. Intra-comparability of wages; a. Salary score for district under investigation, b. Salary score for competitor district. 3. Inter-comparability of wages; a. Weighted index of average earnings, year $t-1$, b. Weighted index of average earnings, year t, c. Average salary, year $t-1$, d. Average salary, year t. 4. Ability to pay; a. Local revenue raised per pupil belonging, b. True valuation per pupil belonging. The criterion variable used was teacher withdrawal rate.

Data for all of the variables were gathered for each of the 24 school districts for the ten-year period of the study and statistically analyzed through a multiple linear regression computer program. Through the use of this technique the proportion of contribution each of a set of independent variables makes to the prediction of the criterion variable can be determined. The multiple linear regression computer program also generates regression coefficients, an entry level sequence, an intercorrelation matrix and tests of significance.

Conclusions

1. Economic factors, as represented by the wage criteria, added significantly to the prediction of teacher withdrawal in the State of Maryland for the period 1960 to 1970. The proportion of contribution although low was significant.
2. Of the wage criteria defined, inter-comparability of wages made the largest and only significant contribution to the prediction of teacher withdrawal in the State of Maryland during this period.
3. Prediction of teacher withdrawal was not found to be affected by whether a school district was metropolitan or non-metropolitan. The economic criteria exhibited a measurable degree of relationship with the withdrawal of teachers in both the metropolitan and non-metropolitan districts. The unique contribution of economic concerns to prediction of teacher withdrawal, however, was two and one half times greater for metropolitan than non-metropolitan teachers.
4. The ability to pay wage criterion made the only significant contribution to the prediction of teacher withdrawal in the metropolitan districts of the State of Maryland. In the case of the non-metropolitan districts, the inter-comparability wage criterion made the only significant contribution to the prediction of teacher withdrawal.

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN A SET OF ECONOMIC CONCERNS AND TEACHER WITHDRAWAL IN THE STATE OF MARYLAND FROM 1960 TO 1970

by
Jerome James Ryscavage, Jr.

Dissertation submitted to the Faculty of the Graduate School
of the University of Maryland in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
1972

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CHAPTER I

INTRODUCTION

> The consideration of teacher's salaries should be approached from its economic and social aspects and not in terms of sentiment. The teacher is not in the need of pity and cheap sentimentality, but requires only a clearcut economic and social consideration to secure from the community adequate return for her services. Executive and teacher alike can learn to consider salaries from the standpoint of the economic laws set forth, and to realize that certain artificial restrictions or assumptions cannot hold over a period of years.[1]

Over forty years have passed since it was recognized that the administration of compensation for teachers should be approached on an objective basis. Implicit in the above statement is the thought that the teacher will assess the value of remaining in his or her position, as well as possibly the profession itself, through an objective evaluation of economic criteria. The validity of this implication for the public school teacher provides the *raison d'etre* for this study.

Although it has been shown that inadequate remuneration is given as a prime reason for leaving a teaching position, little information is available which shows in an objective fashion the relationship between economic concerns and withdrawal of public school teachers. Such information would provide an answer to the question of whether or not economic concerns have a measurable effect on the retention of teachers. More precisely, the problem posed through this investigation is:

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[1] Arthur B. Moehlman, Public School Finance (Chicago: Rand McNally, 1927, p. 121.

TO DEVELOP AN OBJECTIVE WAY OF MEASURING THE RELATION BETWEEN SELECTED ECONOMIC CRITERIA AND TEACHER WITHDRAWAL FROM TEACHING POSITIONS OR THE PROFESSION. INTEGRAL TO THIS PROBLEM IS THE DETERMINATION OF THE EQUITY AND ADEQUACY OF THE FINANCIAL REMUNERATION OF TEACHERS THROUGH THE USE OF THE ECONOMIC CRITERIA SELECTED.

By statistical analysis of the relationship between a set of economic criteria and teacher withdrawal a measurement which is free from possible distortions engendered by personal feelings is sought. The set of economic criteria utilized are wage criteria or benchmarks by which the equity and adequacy of financial remuneration can be appraised. Specifically, the criteria include cost of living, intra-comparability of wages, inter-comparability of wages, and ability to pay.

A FRAMEWORK FOR THE ANALYSIS OF THE PROBLEM

The questions to be postulated in relation to teacher withdrawal and these wage criteria are as follows:

1) Is there a relationship between teacher withdrawal and the economic criteria as defined?

2) Is there a relationship between teacher withdrawal and the criterion of cost of living?

3) Is there a relationship between teacher withdrawal and the criterion of intra-comparability of wages?

4) Is there a relationship between teacher withdrawal and the criterion of inter-comparability of wages?

5) Is there a relationship between teacher withdrawal and the criterion of ability to pay?

Approximately three-fourths of the nation's population today resides in areas which are considered metropolitan in nature. The highly populated, fast growing metropolitan areas present a contrasting socio-economic environment *vis-a-vis* the slower growth non-metropolitan areas. Because of the nature of the population in this study (i.e., the State of Maryland), it is possible to effect a comparison of the relationship in metropolitan as opposed to non-metropolitan school districts.[2] Considering the criteria to be included, the availability of the data, and the relevance of the anticipated findings, the past ten academic years from 1960-61 through 1969-70 serve as the time dimension of the study.

Questions asked in relation to this comparative analysis are as follows:

1) Is there a difference in the relationship between teacher withdrawal and the economic criteria, as defined, for metropolitan as opposed to non-metropolitan districts?

2) Is there a difference in the relationship between teacher withdrawal and the criterion of cost of living for metropolitan as opposed to non-metropolitan districts?

3) Is there a difference in the relationship between teacher withdrawal and the criterion of intra-comparability of wages for metropolitan as opposed to non-metropolitan districts?

4) Is there a difference in the relationship between teacher withdrawal and the criterion of inter-comparability of wages for metropolitan as opposed to non-metropolitan districts?

5) Is there a difference in the relationship between teacher withdrawal and the criterion of ability to pay for metropolitan as opposed to non-metropolitan districts?

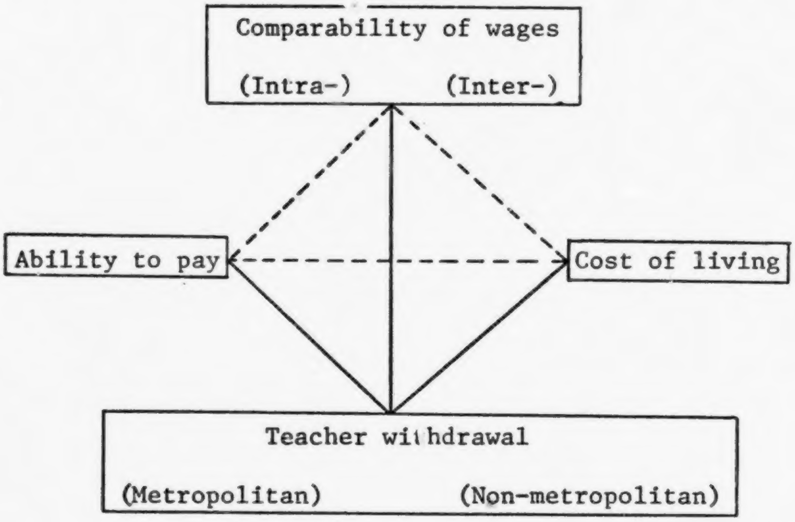
The thesis of this study is that certain economic criteria bear a relationship to teacher withdrawal. Furthermore, the study compares this relationship in metropolitan and non-metropolitan districts in an attempt to determine the existence of differential effects. The conceptual framework for the analysis of the problem is illustrated in Figure I by showing the direct connection of the economic constructs of cost of living, comparability of wages, and ability to pay with the observable phenomena of teacher withdrawal in both metropolitan and non-metropolitan districts.[3]

---

[2] In October, 1960 eight metropolitan districts represented 79 percent of the State of Maryland student as well as teacher population. Source: 95th Annual Report of the State Board of Education of Maryland (Baltimore: Maryland State Department of Education, 1961), pp. 75 and 122.

Figure I

CONCEPTUAL FRAMEWORK FOR THE ANALYSIS OF THE PROBLEM


Comparability of wages
(Intra-)
(Inter-)
Ability to pay
Cost of living
Teacher withdrawal
(Metropolitan)
(Non-metropolitan)

---

[3] ------: Relationships between constructs which are assumed to be well established, but are not directly tested through this investigation.

______: Relationships between constructs which are assumed to be well established and are directly tested through this investigation.

RATIONALE OF THE PROBLEM

Teacher withdrawal can be attributed to a number of causes--some of them unavoidable such as death, retirement, health, etc. whereas others are considered avoidable. For the individual school district the latter type of causes are of particular importance because of their direct relationship to possible alternatives which could be taken by the school district to help diminish the number of teachers withdrawing from their present positions. An avoidable cause often found by investigators as the most cited reason for withdrawing from a teaching position has been low salary.

It is possible, however, that this formal response for leaving is only a subterfuge for other reasons. In other words, though the economic concern may be partially valid, it could be but one of the factors contributing to a teacher's decision to leave without being, however, the compelling factor. If forces other than economic considerations are more strongly associated with withdrawal decisions than economic considerations, this factor will have implications for a school district in its efforts to attract and hold a teaching force.

Both public and private enterprises increasingly rely on wage criteria to answer questions pertinent to wage determination. These wage criteria or "clearcut economic and social considerations" which Moehlman pointed to years ago are the tools with which negotiators can rationally begin to discuss the equity and adequacy of financial remuneration. This study assumes that the individual teacher is cognizant of the equity and adequacy of his or her salary. Furthermore, there are two assumptions which are integral to the logic underlying the reason for choosing wage criteria as the means of analysis in this investigation: 1) Teachers use wage criteria in the determination of what their salary should be, and 2) Teachers are as cognizant of wage criteria in decisions leading to withdrawal as they are in decisions having to do with determination of salary. If it is tenable to state that similar wage criteria are operative in both determination of salary and withdrawal decisions, an investigation of the relationship between these wage criteria and withdrawal appears a logical consequence.

A teacher's decision to leave, based on economic considerations, may not be readily perceived by an observer or the individual teacher himself. Wage criteria represent general forces operating within the socio-economic milieu of the individual which, though possibly not acknowledged directly by him, manifest themselves as the individual comes to a decision as to whether he will remain in or leave his present position. These forces, then, may operate on an underlying level but continue to exert a real pressure on the individual decision-maker.

Neither should it be assumed that the utilization of wage criteria, as measures of economic considerations, are the only means of investigating the question of the relationship between economic considerations and withdrawal. Wage criteria are essentially short-run and are used either directly or indirectly to determine the immediate wage level. An argument could be raised to the effect that traditional supply-and-demand theory operates in the long run and is reflected to some degree in each of the wage criteria. This investigation, however, is confined solely to those wage criteria in use today which appear to be most relevant to the area of public education.

SIGNIFICANCE OF THE STUDY

Withdrawal from a teaching position is confounding for at least two reasons, namely, its complexity and its seeming inevitability. Because of these characteristics it is often relegated to a position of minor importance until negotiations arise. When negotiations are undertaken, salaries are a frequent topic of discussion. One of the rationales used to support a salary increase is phrased in terms of the positive effect a salary increase has on the retention of teachers. The validity of this rationale for salary negotiations for the public school teacher provided the initial interest in this topic.

The disadvantages of losing competent teachers are clear. The quest for professional personnel by other local school districts attracts these teachers away through the offering of more rewarding conditions than in their present employment. The vacancy and replacement results in a constant readjustment for the system, a loss of continuity of instruction and policy, a lack of identity of teachers with the community, and general conditions under which it is most difficult to develop a local *esprit de corps*. Any findings which elaborate on the phenomena of teacher withdrawal would tend to unravel some of the complexities inherent in the withdrawal problem, hopefully contributing to better education.

Furthermore, Nygard and Roelfs[4] isolate what is probably the most critical loss. They indicate that a situation in which over ten percent of the total teaching force leaves classroom service each year contributes to a less qualified employee group. In addition, this situation results in added costs to obtain replacements, to orient and train new workers, and of most importance, inevitably leads to a loss in pupil learning.

The significance of this investigation goes beyond the practical implications of teacher mobility, as it has some bearing on classical economic theory. In accordance with classical economic theory it is held that the individual worker's reaction to the price system is the most efficient means of allocating manpower resources. Movement between jobs would primarily be the result of more attractive wages. Whether or not this theory holds for teachers provides additional significance to this investigation.

DEFINITION OF TERMS

The following definitions apply to the terms used in this study. In some cases, the operational definitions will differ from those given for the same terms in the private sector due to the nature of public education.

Ability to pay: The theory that wages should be determined by the employer's financial condition.

---

[4] Joseph M. Nygard and R.M. Roelfs in The Theory and Practice of School Finance, eds. Warren E. Gauerke and Jack R. Childress (Chicago: Rand McNally, 1967), pp. 310-361.

Area wage survey: Surveys performed by the U.S. Department of Labor (Bureau of Labor Statistics) in over 90 metropolitan areas as well as special areas in the United States to determine occupational earnings, establishment practices, and supplementary wage provisions.

Average salary: Salaries paid to teachers divided by the number of full-time equivalent teachers as defined by the Maryland State Department of Education.

Cost of living: The cost of purchasing those goods and services which are included in an accepted standard level of consumption such as measured by the Consumer Price Index as published by the Bureau of Labor Statistics.

Index: A ratio or other number derived from a series of observations and used as an indication or measure of relative value.

Inter-comparability of wages: Wage comparisons among dissimilar occupations.

Intra-comparability of wages: Wage comparisons within the same occupation but differing political jurisdictions.

Local effort per pupil: The amount of funds raised by the local political jurisdiction per pupil belonging in the school district.

Metropolitan district: A district which is located within a standard metropolitan statistical area as defined by the Bureau of the Budget.

Non-metropolitan statistical area: Those districts which do not fall within a standard metropolitan statistical area as defined by the Bureau of the Budget.

Standard metropolitan statistical area (SMSA): The Bureau of the Budget definition involves two considerations: 1) A city or cities of specified population (50,000 inhabitants) to constitute the central city and to identify the county in which it is located as the central county, and 2) Economic and social relationships with contiguous counties which are metropolitan in character, so that the periphery of the specific metropolitan area may be determined. SMSA's may cross state lines, if this is necessary in order to include qualified contiguous counties.

Teacher turnover rate: The aggregate number of teachers who move into and out of a districts' employ divided by the number of teachers on the staff.

Teacher withdrawal rate: The number of teachers who withdraw from their positions for possible economic reasons divided by the number of teachers on the staff.

Wealth per pupil: Total assessed valuation in the local district divided by the number of pupils belonging.

LIMITATIONS TO THE STUDY

A primary limitation to this study centers about the validity of the data utilized to develop the various wage criteria.

Considering the breadth of the study one is forced to work with averages, in some cases, rather than maximum/minimum figures because the focus of the study involves the analysis of trends. Though this is probably the most feasible way in which to study a trend situation it is recognized that any such parsimonious procedure has inherent disadvantages in attempting to make a comprehensive description.

Another data limitation has to do with the inability to secure certain figures which have a unique applicability to the local district. In particular, the cost of living imputations for non-metropolitan districts may not accurately reflect the change in real costs for these districts. At this time, however, this point remains a moot issue in that little work has been done in the development of cost of living figures for non-metropolitan areas.

Finally, the last data limitation concerns the validity of the withdrawal figures. Though the Maryland State Department of Education makes a clear delineation as to the various reasons given for withdrawal, the reasons given by the teacher may not actually represent the true reasons for leaving. Admittedly, this is a limitation inherent within the Maryland State Department of Education data, but it is a limitation which is most difficult to compensate for as well as identify.

As indicated earlier, the use of wage criteria are but one way of examining the impact of economic concerns on teacher withdrawal. The danger of erroneously interpreting *ex post facto* research stems in part from the lack of control of the independent variables, and in part from the plausibility of many explanations of complex events. The explanation of the withdrawal of teachers through these means will therefore limit any generalization to considerations surrounding these criteria alone.

PLAN OF THE PAPER

Through this initial chapter the problem under investigation was stated in as concise terms as possible, specifically posing two sets of questions to be answered through the statistical analysis. In the rationale for the study, the logic underlying the investigation of the problem was discussed. The study has both theoretical and practical implications. The limitations serve to constrain the conclusions of the investigation.

Chapter two describes the work already done in the area of economic concerns and their relation to teacher withdrawal. Though some of the literature reviewed is addressed to the private rather than the public sector, this chapter identifies only work relevant to public education.

Chapter three presents the design of the study along with the procedures for gathering and analyzing the dat .

Findings on the questions concerning wage criteria and their relationship to teacher withdrawal are presented in Chapter four.

In Chapter five the conclusions developed from the findings are discussed. A summary of the study is followed by recommendations for further study.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The most recent nation-wide survey of teacher mobility and loss was done in 1967 by the National Education Association.[1] Of a total of 3291 respondents (an 86.5% return) who were randomly selected to be representative of the nation's public school teachers it was found that approximately one out of every ten teachers (10.6%) had either moved to another school system in the same state, moved to another school system in another state, or left the profession. Approximately one in five who transferred to teach in another school system listed higher salary as the major reason for leaving. Of those who left the profession, 5.8 percent listed economic benefits as their reason for leaving.

The reason for concern in withdrawal information such as this rests with the basic assumption given by Bush[2] in that, "The education of students will be better in a school that is characterized by a permanent cadre of career teachers than one which is staffed by a troupe of itinerants". Nygard and Roelfs[3] have alluded to the economic consequences of turnover to a school district. A report of the National Commission on Teacher Education and Professional Standards,[4] furthermore, points out the false economy of replacing experienced teachers by inexperienced ones when they state,

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[1] "Teacher Mobility and Teacher Loss", NEA Research Bulletin, XLVI (December, 1968), 120-122.

[2] Robert N. Bush in The Teacher Dropout, ed. T.M. Stinnett (Itasca, Ill.: F.E. Peacock Publishers, 1970), p. 111.

[3] Nygard and Roelfs, op. cit., pp. 310-361.

> The present instability in the teaching profession probably costs the American people more than it would to provide adequate salaries and good working conditions for teachers. The cost of preparing thousands each year for teaching, thousands who teach one or two years and then quit is probably greater than the providing of salary levels which would cut the annual leaving rate in half, even if the other vast social losses in such instability are not taken into account.

T.M. Stinnett,[5] in one of the most recent treatments of the teacher dropout problem, builds a most convincing argument for the study of this problem by the teaching profession itself when he states, "No occupational group can hope to attain recognition as a profession if a relatively large number of practitioners are transients who do not look upon their work as a career". There appear, therefore, to be powerful economic as well as educational reasons for the study of teacher withdrawal which, in turn, have distinct implications for the student, the community, and the teaching profession.

A review of the literature indicates that teacher withdrawal is a complex phenomenon which requires a micro-analytic mode of study. The topics of teacher withdrawal and economic remuneration are often conceptualized as interacting. More pointedly, the Committee on Tax

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[4] A Statement Regarding Personnel Needs of the Schools, NCTEPS (Washington, D.C.: National Education Association, 1964), p. 15.

[5] Stinnett, op. cit., p. 1.

Education and School Finance of 1958[6] indicates that, "Unless the American public can raise the salaries of teachers to a professional level, education will continue to lose talented and interested people to all fields".

This review will concentrate on teacher withdrawal and economic considerations and their interaction. The following three goals are set forth for the review in an attempt to provide a substantive base for interpreting the findings developed from the empirical data of the study:

1) To describe the way in which teacher withdrawal is perceived as occurring for purposes of this study.
2) To further an understanding of the theory of labor allocation and its relation to public education as part of the public sector of the economy.
3) To review the empirical data existent on the subject of teacher withdrawal and economic considerations pertinent to this study.

Teacher withdrawal from the wage criteria perspective

David Belcher[7] asserts in his text on Wage and Salary Administration that any final decision concerning wage level determination must meet the test of the ability to attract and hold an adequate labor force. From this standpoint, developed for wage level determination in the private sector of the economy, one can look at teacher withdrawal in the public sector.

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[6] Financing Professional Salaries for Professional Personnel, Committee on Tax Education and School Finance (Washington, D.C.: National Education Association, 1958), p. 9.

[7] David Belcher, Wage and Salary Administration (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962), p. 168.

Belcher[8] and Jules Bachman[9] delineate a number of factors which influence wage level determination: comparative wage rates, cost of living, ability to pay, productivity, minimum budgets, the living wage, and purchasing power. All these factors are wage criteria or points of reference from which the equity and adequacy of remuneration can be judged. In assessing the importance of these wage criteria Belcher[10] supported by Arthur Ross,[11] find that of the seven criteria mentioned, only the first three (i.e., comparative wage rates, cost of living, and ability to pay) are crucial to the wage level determination process. Productivity in the private sector is seen as operative, in most cases, through the ability to pay criterion; in the public sector of education productivity has been difficult to define, and as a result, close to impossible to measure. Minimum budgets and the concept of a living wage are too indefinite as standards. Purchasing power is considered too broad a consideration to be particularly meaningful. Irving Bernstein[12] adds empirical credence to the conclusions of Belcher and Ross through his analysis of criteria cited in published wage-arbitration cases between 1945-50. In these cases wage comparisons, cost of living, and ability to pay accounted for 85 percent of the 1027 citations by unions, employers, and arbitrators.

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[8] Ibid., pp. 144-148.

[9] Jules Bachman, Economic Data Utilized in Wage Arbitration (Philadelphia: University of Pennsylvania Press, 1952), pp. 2-3.

[10] Belcher, op. cit., p. 168.

[11] Arthur Ross in New Concepts in Wage Determination, eds. George W. Taylor and Frank C. Pierson (New York: McGraw-Hill, 1957), pp. 190-19

[12] Irving Bernstein, Arbitration of Wages (Berkeley: University of California Press, 1954), pp. 28-29.

Donald Gerwin,[13] in analyzing compensation decisions in public organizations, states that, "... there is no widely accepted theory of public salary determination". However, as an outgrowth of his study of the budgetary process in a public organization (the Pittsburg, Pennsylvania school system), Gerwin found that the motivating force behind an increase in teacher salaries was teacher dissatisfaction as measured by inter-organizational salary comparisons and ability to pay. Furthermore, Gerwin found that in any given public organization, intra-occupational comparisons tend not to lead to dissatisfaction due to the existence of salary schedules.

Three recent doctoral studies investigated the determinants of teacher salaries. The relationship between selected economic factors and teachers' salaries in the State of Minnesota was studied by Christenson[14] and Lund.[15] Though lacking a theoretical framework for teacher salary determination, both researchers found a relationship between four economic categories (teacher supply, national productivity, demand for education, and ability to pay for education) and the criterion variables of minimum and maximum B.A. salary levels. Of significance in relation to the cited wage criteria is the relationship found between ability to pay for education and teacher salaries and the fact that the Consumer Price Index (one of the proxy variables under the category of national productivity) proved to be the most statistically efficient predictor of teacher salary level. A 1962 study done by Martin Schoppemeyer[16] examined the theoretical determinants of teachers' salaries by deriving wage implications of five different economic schools of thought: the classical theory, the subsistence theory, the wages-fund theory, the marginal utility theory, and the macroeconomic theory. This study concluded that salaries of teachers resulted from economic assumptions implicit in judgements of the value of public education current in a community--which translated into measurable terms implies an ability to pay for education criterion.

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[13] Donald Gerwin, "Compensation Decisions in Public Organizations", Industrial Relations, VIII (February, 1969), 174.

[14] Neil E. Christenson, "A Study of the Relationship Between Selected Economic Factors and Teachers' Salaries in the Twin Cities Metropolitan Area" (unpublished Ph.D. dissertation, University of Minnesota, 1968), pp. 136-142.

[15] James P. Lund, "A Study of the Relationship Between Selected Economic Factors and Teachers' Salaries in Non-metropolitan Minnesota School Districts with Minimum Enrollment of 1500 Pupils" (unpublished Ph.D. dissertation, University of Minnesota, 1968), pp. 103-111.

Other writers describe determinants of teachers' salaries. In some cases, writers tend to confirm certain criteria already identified. In other cases, writers question the importance of some criteria; and in still other cases, writers introduce additional criteria to those already specified. Willard Elsbree's[17] set of determinants for the salary schedule of teachers are divided into minimum and maximum categories as follows:

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[16] Martin W. Schoppemeyer, "An Inquiry into the Theoretical Determinants of Teachers' Salaries" (unpublished Ed.D. dissertation, The University of Florida, 1962), pp. 368-373.

[17] Willard Elsbree, Teacher's Salaries (New York: Bureau of Publications, Teachers College of Columbia, 1931), p. 13.

Determinants of a minimum salary

1) Minimum teacher's salary in other communities.
2) Cost of living nationally.
3) Moehlman index--used to supplement the above two.[18]

Determinants of a maximum salary -

1) Maximum teacher's salary in other communities.
2) Wages in other occupations.
3) Moehlman index.
4) Increase in the cost of living per year.

Stuart Anderson,[19] in a review on the topic of the economic status of teacher personnel, described the adequacy of teachers' salaries in terms of cost of living, comparability of wages, and ability to pay for public education.

Leon Keyserling[20] writing for the Conference on Economic Progress delineates the following criteria for an upward adjustment in salaries for teachers:

1) The nationwide average of gains in productivity or output per man hour worked in the entire private economy.

2) The nationwide gain in the productivity potential--this is based on trends in technology, science, labor/management skills and is really equal to what actual productivity is or would be under conditions of reasonably full resource use.

3) The cost of living.

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[18] Moehlman, op. cit., pp. 140-152. Moehlman developed an index for the construction of teacher's salaries which was based on the wages of labor. Moehlman assumed that the wages of labor form a sensitive barometer to economic conditions.

[19] Stuart Anderson, "The Economic Status of Teacher Personnel", Journal of Educational Research, XLIII (May, 1950), 697-712.

[20] Leon Keyserling, Goals for Teaching Salaries in Our Public Schools (Washington, D.C.: Conference on Economic Progress, 1968), pp. 68-70

A number of wage criteria receive more emphasis than others in shaping and evaluating the teacher salary schedule. The subject of this study, however, is not salary determination, but the relationship between certain economic criteria (i.e., those wage criteria associated with salary determination) and teacher withdrawal. The rationale for utilizing wage criteria to study teacher withdrawal should, therefore, be made apparent. Herbert Parnes,[21] in his extensive review of Research on Labor Mobility, shows the relationship of mobility to wage criteria when he states, "Two conditions must exist if the functional relationship between labor mobility and economic flexibility is to prevail:

> 1) The employment decisions of workers or potential workers must be rational; that is, they must be made in terms of ascertainable criteria, and
>
> 2) These criteria must involve, either directly or indirectly, the factors that measure the relative social importance of alternative activities."

Through the use of the wage criteria of cost of living, comparability of wages and ability to pay for education the above two conditions will be fulfilled in this study of the relationship between economic concerns and their effect on the withdrawal of public school teachers.

Teacher withdrawal and its relation to labor allocation theory

Classical economic theory has held, until very recently, that the individual worker's reaction to the price system is the most efficient manner of allocating manpower resources. Movement among jobs, then is primarily the result of more attractive wages. Parnes[22] describes the traditional labor allocation theory more fully as follows:

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[21] Herbert S. Parnes, Research on Labor Mobility (New York: Social Service Research Council, 1954), p. 144.

> If labor mobility is "functional" in the sense of adapting the labor supply to changing labor requirements, individual workers must tend to choose employment where the need for them is the greatest. Traditional economic theory suggests that this will be the case because of the responsiveness of workers to wage differentials. According to this theory, differentials in wages among comparable jobs reflect differences in the relative "need" for workers. The movement of workers toward higher paying jobs then assures the most effective allocation of the labor supply.

Whether workers evaluate jobs chiefly in terms of wages, or whether other elements in personnel policy can be of equal or greater importance, has important implications for any organization.

A recent report by the College Placement Council[23] lends evidence to the point of view taken by the classical economist. College seniors were asked which values were most sought in a job. It was found that "money" was rated far down the list of values for both males and females. After three years of employment, "money" assumed the first position in importance for men and the second position in importance for women--women rated "movement to a different location" first. The idealism of the student gives way to the realities of the world once one enters full-time employment.

Somewhat antithetical to the thinking of the classical economists and the empirical work which supports their theory is a study of

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[22] Parnes, op. cit., p. 9.

[23] The College Graduate: Turnover and Mobility, Research Report Number 3(Bethlehem, Pa.: College Placement, Inc., 1970), pp. 15-16.

The Mobility of College Faculties by Howard Marshall.[24] Marshall found that the labor force does not change jobs as readily as the simple statement of the classical economists would lead us to believe. Marshall's work serves to reinforce the findings of others such as Mayo and Herzberg. Due to his work in a Philadelphia textile plant, Elton Mayo,[25] concluded that the efficiency experts were wrong; not until the conditions of working group formations were satisfied did the financial incentive come into play at all. Herzberg's[26] study of motivation concludes that improving conditions surrounding work cannot motivate--they only encourage enjoyment away from work or produce short term changes in attention. He considers salary as one of these short-term satisfiers or "hygienic" factors.

The exact relationship between economic factors and mobility, however, is probably not as clearly defined as economic theory hypothesizes nor is it totally non-existent as others would tend to reason. After his review of research findings in the area of labor mobility Herbert Parnes[27] concludes,

> The interrelationship between wages and mobility is not nearly so direct or intricate as economic theory would suggest. On the other hand, it is equally clear that some relationship does exist and that it is probably stronger when employment levels are high and job opportunities are abundant. Under these conditions the assumptions of economic theory are more nearly met.

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[24] Howard D. Marshall, The Mobility of College Faculties (New York: Pageant Press, Inc., 1964), pp. 124-138.

[25] Elton Mayo, The Social Problems of Industrial Civilization (Boston: Harvard University, 1945), p. 111.

[26] Frederick Herzberg, Work and the Nature of Man (New York: The World Publishing Company, 1966), pp. 72-91.

[27] Parnes, op. cit., p. 187.

Frederick Gaudet[28] further detracts from the precision of the classical theory of labor allocation when he indicates that he has data to support either side of the relationship of the financial position of workers and whether it is improved or not through job shifts.[29]

Findings as mixed as these tend to substantiate the view of Stinnett[30] who, though acknowledging the importance of financial reward, feels that factors connected with the limits of responsibility and influence in the nature of the teaching job itself are as important to persistence in a position as the obvious factor of salary. A history of the study of pay could be construed by some to show that we have progressed from a model of man that viewed him as being primarily economically motivated to a view that stresses social needs and the need for self-actualization. A review of the literature would seem to indicate that man (in this study, the teacher) is motivated by both economic and social needs.

The effects of size of school district on teacher withdrawal

A sub-hypothesis of this study is that there are differences in the effects of economic considerations on teacher withdrawal in the metropolitan and non-metropolitan districts of the State of Maryland. Studies on the effects of school or district size and teacher withdrawal are thus reviewed.

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[28] Frederick J. Gaudet, Labor Turnover: Calculation and Cost (New York: American Management Association, 1960), p. 9.

[29] Anne Bezanon, "The Advantages of Labor Turnover: An Illustration Case", Quarterly Journal of Economics, XLII (May, 1928), pp. 450-464. Positive findings were found through this study. W. Rupert MacLaurin and Charles A. Meyers, "Wages and Movement of Factory Labor", Quarterly Journal of Economics, LVII (Feb., 1943), pp. 247-264. Here it was found that the financial position of the worker was not improved through job shifts.

[30] Stinnett, op. cit., p. 2.

An inverse relationship between turnover and size of community (i.e., as the community increased in size, the percentage of turnover tended to decrease) was found existent in the cities and villages of New York State by Willard Elsbree.[31] The relationship is illustrated in Table I.

Table I

The relationship between size of community and teacher turnover

Communities according to population	% of turnover
Above 50,000	6.52
25,000 - 49,999	11.65
15,000 - 24,999	14.14
10,000 - 14,999	16.11
5,000 - 9,999	15.61
Less than 5,000	17.40

A study by Wendall White[32] in the State of Iowa reported data to support a similar conclusion. In this case, White found that the rate of turnover for both elementary and secondary teachers in the smaller cities was greater than the turnover for teachers working in the large cities. Frank Lindenfield,[33] in a U.S. Office of Education study, also found that districts with enrollments below 600 showed a higher separation rate than those above 600, but the differences within these two groups was small.

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[31] Willard Elsbree, Teacher Turnover in the Cities and Villages of New York State (New York: Bureau of Publications, Teachers College of Columbia, 1928), p. 21.

[32] Wendall White, "Rate and Cause of Turnover of Iowa Teachers", American School Board Journal, LXIX (December, 1935), p. 53.

[33] Frank Lindenfield, Teacher Turnover in Public and Elementary and Secondary Schools, U.S. Office of Education Circular n. 675, (Washington, D.C.: Government Printing Office, 1963, p. 12.

Cecil Scott and Calvin Reed[34] studied the turnover for 1937-38 in 100 Nebraska secondary schools. These schools were representative of all schools in the state on the basis of school size. Though the subject of this study was size of secondary schools rather than size of school districts, the study showed that school size had no relationship to teacher withdrawal. August Rivera[35] studied those elementary teachers who had entered the Minneapolis public school system and left after 0, 1, 2, and 3 years. He found no statistically significant difference for staying and leaving teachers according to size of attendance area assigned. A study by William Forrest[36] which dealt with turnover in the Los Angeles area found no correlation between the size of a school district and the rate of teacher turnover, but did find a correlation between the rate of growth of a district and the rate of turnover--that is, the faster the growth in student population in a district, the lower the turnover for the district.

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[34] Cecil W. Scott and Calvin H. Reed, "Salary as a Cause of Teacher Turnover in Nebraska Public Schools", School and Society, XLIX (January, 1939), pp. 30-32.

[35] August Rivera, "A Study of Factors Related to Elementary Teacher Turnover in the Minneapolis Public School System" (unpublished Ph.D. dissertation, University of Minnesota, 1968), p. 104.

[36] William B. Forrest, "Teacher Turnover Can Be Reduced", Nation's Schools, LIV (October, 1954), p. 58.

A study with findings which appear to contradict the findings of Forrest was done by Joseph Flagg.[37] He found that as the size of the school increases, the climate within the school tends to become more closed. As the climate becomes more closed, there is a tendency for more turnover to occur.

The relationship between size and teacher withdrawal appears paradoxical in a situation described by Jack Klienert.[38] There, a well-financed, fast growth, large suburban district, which provided above average salaries and excellent working conditions experienced excessive turnover of faculty. In analyzing the differences of teachers who stayed in the district and those who left during the three year period, 1964-67, Klienert concluded that two factors caused greater number of young teachers (than old teachers) to move in and then out of one of the nation's best suburban school districts:

> 1) The high cost of living teachers encounter where the best financed suburban schools are located.
>
> 2) In large part, much higher turnover is apparent in areas where the professional environment is first rate because of the need that today's young teaching professional has for a greater recognition and challenge than the conventional teaching role can give her.

Related to these conclusions are the findings of Winfield and Scott[39] from a 1938-39 study patterned after their 1937-38 study of Nebraska secondary schools. In the 1937-38 study, size of school bore no consistent relationship to turnover, but in the 1938-39 study the larger the school, the more often teachers gave salary as a reason for withdrawal. The smaller the school, the more the teachers gave a reason other than salary for withdrawal. Conflicting findings thus exist among different researchers in this area of inquiry as well as in replicative studies done by the same investigators.

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[37] Joseph T. Flagg, Jr., "The Organizational Climate of Schools: Its Relationship to Pupil Achievement, Size of School and Teacher Turnover" (unpublished Ed. D. dissertation, Rutgers University, 1964), pp. 55-56.

[38] Jack Klienert, "Teacher Turnover in the Affluent School District", The Clearing House, XLII (January, 1968), 297-299.

[39] Cecil W. Scott and Calvin H. Reed, "Salary and Teacher Turnover Relationships for Nebraska Public High Schools", School and Society, LI (March, 1940), 356-360.

Teacher withdrawal and its' relationship to economic considerations

The underlying thesis of Stinnett's[40] treatment of the teacher turnover problem is that the holding power of teachers has too often been equated with salary. At best, he feels, this is an oversimplificiation; salary may be more important as a factor in recruitment than in encouraging persistence in teaching. Though financial reward is of importance, several studies indicate that salary is not the most important factor in holding power.

Studies which show that financial considerations are one of the prime motivating factors in withdrawal decisions are characterized by their use of the survey questionnaire as the methodological tool for investigation. These studies are presented in a chronological order to illustrate the consistency over time and also the nationwide coverage of the findings.

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[40] Stinnett, op. cit., p. 2.

Henry Tape,[41] investigating turnover in the one room schools of Michigan prior to World War II, found that one of the three most frequently given reasons for teachers to withdraw voluntarily from service was their desire for higher salary. In a frequency tabulation of responses from 448 city and county school systems throughout the United States the journal, Education for Victory,[42] reported that the second most frequent response (behind that of going into the military) for leaving a teaching position by men was to take a war industries job, a result of the relatively low teaching salaries of the times. Overlapping both the post World War II period of the latter 40's and the first five years of the 1950 decade was Reiner's[43] study of elementary school teachers who left the profession in Connecticut. Reiner found that inadequate salary ranked second as a major factor in causing drop-outs among male teachers, but was infrequently given as a withdrawal reason by females.

Wilbur Stewart[44] examined reasons cited by teachers who withdrew from a teaching position in the State of Indiana from 1951-58. He found economic factors as the third most frequently given reason for teacher withdrawal decisions, particularly for teachers who transferred to a different classroom position in another school system. John Blaser[45] found that economic factors such as an improved salary schedule were the primary items perceived as needing change by men graduates of the University of Idaho who withdrew from teaching (during the period 1951-60); only then would these teachers consider coming back into the profession regardless of what the cause for their leaving teaching. In a statewide study of Ohio teachers who withdrew during the school year 1952-53, Wilbur Harris,[46] found that inadequate salary ranked second as the major cause of teacher withdrawal. Harris concluded that decisions by teachers to withdraw were not usually the result of one factor alone, but the decisions were an outgrowth of several factors. Ernest Wise[47] investigated science teachers who left the profession between 1953 and 1956 in upstate New York. His general conclusion was that the loss of science teachers is due primarily to the brighter future in other areas of employment and inadequate salaries paid in education compared to other areas of employment.

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[41] Henry A. Tape, Factors Affecting Turnover of Teachers of the One Room Rural Schools of Michigan (New York: Bureau of Publications, Teachers College of Columbia, 1939), pp. 63-64.

[42] "Why Are Teachers Leaving Positions", Education for Victory, I (January, 1943), 14-15.

[43] Hyman L. Reiner, "A Study of the Factors Which Have Caused Elementary School Teachers to Leave the Profession" (unpublished Ph.D. dissertation, University of Connecticut, 1957), pp. 202-204.

[44] Wilbur E. Stewart, "Factors Involved in the Withdrawal of Teachers Who Held the Same Position in Indiana from 1951 to 1958" (unpublished Ed.D. dissertation, Indiana University, 1963), p. 129.

In a study of all the secondary school teachers who withdrew from the profession in the State of Oklahoma for 1954-55, Russell

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[45] John Blaser, "Factors Contributing to the Problem of Men Graduates from the University of Idaho (1951-60) Leaving the Teaching Profession (unpublished Ed.D. dissertation, University of Idaho, 1965), pp. 3, 155-157.

[46] Wilbur Harris, "Factors Influencing the Withdrawal of Teachers from the Ohio Public Schools" (unpublished Ed.D. dissertation, Indiana University, 1957), pp. 262-265.

[47] Ernest G. Wise, "An Investigation of the Stated Reasons Why Some Teachers Leave Science Teaching" (unpublished Ph.D. dissertation, Syracuse University, 1960), pp. 334-352.

Walker,[48] found that salary considerations were the one cause most frequently cited as the reason for leaving the teaching profession. Frank Fusco,[49] in a study of the reasons for teacher turnover in the Levittown, New York school district, found that inadequate salaries had the highest frequency of response to his questionnaire. Richard Hall,[50] in a study of teachers in the State of Nebraska who vacated their positions during the period 1957-59 concluded, like Harris, that the majority of teachers made their decision to vacate a position due to a combination of reasons with the obtaining of a higher salary in another teaching job or elsewhere ranking high in their reasons for withdrawal.

Phillips, Bonk, and Mitchell[51] asked superintendents of schools in the State of Indiana to supply information on teachers who left their school systems between 1954 and 1965. Salary increases or advancement in position in conjunction with salary increases was the main factor given in decisions to move. Thorndike and Hagen[52] found that 66 percent of the teachers who left their teaching positions gave "pay too low" as their major reason. George Green,[53] in a study of the causes for turnover in the central schools of New York State, found that the "acceptance of a better position" and "to receive a better salary" were the leading causes for resignation of the teachers he studied. The reason cited by a majority of the men in a study (involving 4000 teachers who withdrew from teaching) in the secondary schools of Ohio according to Earl Metz[54] was because present salary was too low--this reason, however, was not as critical for women.

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[48] Russell L. Walker, "Factors Within the School Systems of Oklahoma Which Cause Teachers to Leave the Profession" (unpublished Ed.D. dissertation, University of Arkansas, 1958), p. 126.

[49] Frank Fusco, "Teacher Turnover in the Levittown School District, Levittown, N.Y. A Study of the Extent and Reasons for Teacher Turnover in the Levittown School District from 9/1/54 to 8/31/61 with Recommendations for Reducing Teacher Turnover in the Levittown School District" (unpublished Ed.D. dissertation, New York University, 1964), pp. 3 and 31.

[50] Richard E. Hall, "Teacher Turnover in Nebraska Public Schools" (unpublished Ed.D. dissertation, University of Nebraska Teachers College, 1960), p. 211.

[51] Berman N. Phillips, Edward Bonk, and J.R. Mitchell, "Can We Reduce Teacher Turnover?", Phi Delta Kappa, XXXVIII (April, 1971), 272-274.

Warren Thomas[55] dealt with the factors associated with the retention of teachers in selected public school systems of Cuyahoga County, Ohio. He concluded that the primary incentive for the improvement of teacher retention is a salary schedule high enough to hold the effective ones. Kent Savage[56] reporting on teacher turnover in Missouri school systems for 1965-66 found that high salaries ranked first or second in all school classifications (i.e., AAA, AA, and A size schools) as the most frequently given reason for leaving. In a Kentucky State Department of Education study Alexander[57] found that economic reasons were the primary reason for resignation. Butefish[58] used an interview to elicit from 30 teachers their reasons for leaving. The item singled out as being the most influential reason given for teacher mobility was that of low salary scale.

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[52] Robert L. Thorndike and Elizabeth Hagen, "Men Teachers and Ex-teachers: Some Attributes and Traits", Teachers College Record, LXII (January, 1969), 306-316.

[53] George Green, "The Extent and Cause of Turnover Among Secondary School Teachers in the Central Schools of New York State for the year 1961-62" (unpublished Ed.D. dissertation, Cornell University, 1964), pp. 193-194.

[54] Earl C. Metz, "A Study of Factors Influencing the Withdrawal of 4000 Teachers from the Ohio Public Schools and the Possibility of Their Return" (unpublished Ph.D. dissertation, The Ohio State University, 1962), pp. 138-144.

[55] Warren F. Thomas, "A Study of Factors Associated with the Retention of Teachers in Selected Public School Systems of Cuyahoga County, Ohio" (unpublished Ph.D. dissertation, Western Reserve University, 1964), pp. 176 and 180.

[56] Kent B. Savage, "Teacher Turnover in Missouri Secondary Schools, 1965-66" (unpublished Ph.D. dissertation, St. Louis University, 1968), pp. 96-104.

The desire to obtain higher paying positions has been reported consistently as a prime reason for withdrawal throughout the nation. It can be inferred from these findings that higher salaries for teachers should reduce withdrawal markedly. Several studies, many of them done within the last ten years, however, have shown that low salaries may not be as critical a factor in the leave decisions of teachers.

Wayne Hill[59] investigated the reason teachers in the secondary schools of Maryland left the profession from 1950 to 1955 and found that professional and personal reasons were cited two and one-half times as often as economic reasons. Wilton Wood[60] found that teachers placed more value on psychological aspects of their job situation than they did on the physical. Since the subjects Wood investigated were teachers in Seventh Day Adventist Schools throughout the nation, this factor should be noted concerning the study. The California Teachers Association Research Bulletin[61] reports of a state-wide survey of teacher drop-outs which found considerable evidence that negative human relationships rank higher as a cause for leaving the profession than inadequate salary.

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[57] S. Kern Alexander, Teacher Turnover Study (Frankfort, Ky.: Kentucky State Department of Education, 1966), pp. 29-31.

[58] W.L. Butefish, "An Analysis of Causative Factors in Teacher Mobility" (unpublished Ed.D. dissertation, Texas Technological College, 1961), pp. 330-337.

[59] Wayne Hill, "Factors Contributing to the Problem of Teachers in the Secondary Schools of Maryland Leaving the Profession from 1950 to 1955" (unpublished Ph.D. dissertation, The University of Pittsburg, (1956), pp. 189-190.

Rufus Browning's analysis[62] of data for 241 former teachers in Montgomery County, Maryland showed that far more teachers left out of necessity (i.e., marriage, pregnancy, home duties, and moving from area) than out of unhappiness with the district. The two leading reasons for leaving which can be associated with unhappiness in the district were: 1) Excessive pressure and work overload, and 2) Dislike for administrative and supervisory practices. Salary was mentioned infrequently and then only by men.

Most of the studies reported upon have been of the survey questionnaire type. Frank Lindenfield,[63] in a study already cited, utilized correlational analysis of data for his study of teachers in public elementary and secondary schools of the United States for 1959-60. This study is noteworthy for its' use of a different type of analysis, correlation. The findings of the study indicated that for teachers as a whole and for men and women separately in the school systems of the sample, correlational analysis revealed no relationship between the variable of average salary and separation rate.

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[60] Wilton H. Wood, "Personnel Factors, Working Conditions, and Teacher Turnover in Seventh Day Adventist Secondary Schools in the U.S." (unpublished Ed.D. dissertation, University of Maryland, 1955) pp. 2, 113-117.

[61] "Teacher Dissatisfaction and Teacher Drop-outs", CTA Research Bulletin, No. 114 (March, 1958).

[62] Rufus C. Browning,"How to to Tackle the Problem of Teacher Turnover", School Management, VII (June, 1963), pp. 80-82.

[63] Lindenfield, op. cit., p. 14.

Joy Whitener[64] studied 937 teachers who entered employment in nine school systems in the St. Louis metropolitan area and one out-of-state system by following the records of entering teachers until they terminated employment. Service tables (similar to mortality tables) were constructed for schools and various classes of teachers. Age at entry and sex of teachers (among the other variables investigated were marital status, teaching level--elementary or secondary, and teaching experience--prior or none) were the two best predictors of length of service (e.g., the older the teacher--up to age 54--the greater the probability of surviving at least ten years) regardless of the district's salary schedule. Survival in the teaching profession was more highly influenced by the attributes of teachers employed than by institutional characteristics.

Two doctoral studies, completed within the last five years, tend to further reinforce the thesis that economic considerations may not be the compelling factor in the decisions of teachers to leave their positions. Kenneth Watkins[65] gathered data from industrial education teachers in six counties in southern California who left their positions from 1956-1961. Categories of financial reasons were responded to in such a manner as to relegate them to unimportance in relation to other factors. Robert Lee's study[66] of teacher turnover in Cobb County, Georgia for the years 1964 to 1966 found that the leading cause of turnover, far outranking economic factors as reasons for withdrawal was that, "The principal showed partiality or inconsistency in dealing with teachers".

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[64] Joy Whitener, "An Actuarial Approach to Teacher Turnover" (unpublished Ed.D. dissertation, Washington University, 1965) pp. 100-102.

W.W. Charters, Jr.,[67] replicating the study originally done by his student, Joy Whitener, analyzed the probability of separation from school districts for the State of Oregon. Charters concluded that the probability of separation is in large part a function of the teacher's sex, age, length of service already completed, and the system size. He added, however, that these were only surface factors in that they offered little in the way of a direct understanding of the fundamental forces affecting teacher separation. Turning to a more general level of conceptual analysis Charters[68]views separation rate as a resultant force or, "... the sum of a set of forces acting on a teacher to increase the likelihood of withdrawal from employment in the district". An indication of what some of these forces might be can best be gained, therefore, from lists of "reasons" for withdrawal rather than any one reason in particular.

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[65] Kenneth E. Watkins, "A Critical Study of Turnover Among Industrial Education Teachers" (unpublished Ed.D. dissertation, University of California at Los Angeles, 1966), pp. 198 and 200.

[66] Robert E. Lee, "A Two Year Study of Teacher Turnover in Cobb County, Georgia" (unpublished Ed.D. dissertation, The University of Georgia, 1968), pp. 105-107.

[67] W.W. Charters, Jr., "Factors Affecting Teacher Survival" American Educational Research Journal, VII (January, 1970), pp. 2-23.

[68] Ibid., p. 24.

Summary of reviewed literature

Teacher withdrawal in this study is hypothesized as being associated with economic considerations. Translating economic considerations into measurable terms could take a number of forms, but from a review of the literature it appears that wage criteria present an objective tool for investigating the efficacy of such a hypothesis. Wage criteria consisting of the cost of living, comparability of wages, and ability to pay have been identified by investigators working in the private sector of the economy as being instrumental in the determination of wages. Various researchers investigating public education have also pointed to the criteria of cost of living, wage comparability, and ability to pay as being most influential in arriving at changes in teacher pay.

Through a review of labor allocation theory it was shown that the question of whether or not economic factors have a measurable effect on the withdrawal of teachers has theoretical implications. Doubt, however, was raised as to the accuracy of assuming that labor mobility is as the classical economist would tend to reason. Various researchers indicate that other factors intervene in the withdrawal decisions of workers mitigating the influence of economic factors. It would appear, therefore, that workers are impelled to withdraw from their positions by a combination of forces, one of which could be economic in nature.

Because of the nature of this study a review of the literature was completed relative to the effects that size of school district might have on teacher withdrawal. No studies were found that attempted to relate size of a district directly to the effect that economic considerations in that district have on teacher withdrawal. Studies relating size of district to teacher withdrawal were numerous and seemed to vary in conclusions along a continuum in which a number of studies served to indicate an inverse relationship existent between size or growth of a district and its' withdrawal rate to several studies which showed little or no relationship between size of district and teacher withdrawal.

It was found that those studies which indicated a strong relationship between economic considerations and their effect on teacher withdrawal were typically more numerous, extended over a longer period of time, and were essentially of the questionnaire survey type in design. Two qualifications to the findings of a positive relationship seem justified: 1) In a number of studies the positive relationship between economic considerations and teacher withdrawal was considered of major significance in the withdrawal of men, but was relatively inapplicable to women, and 2) Several studies indicated that although salary or economic factors may have been found to be the most prevalent reason given for withdrawal, it was believed that withdrawal was an outgrowth of several factors rather than one single factor. Those studies which showed little or no relationship existent tended to have been done more recently in addition to relying on some technique other than the questionnaire survey as their mode of investigation.

CHAPTER III

PROCEDURE

INTRODUCTION

The public education system in the State of Maryland provides the population base from which the data for this study were accumulated. The twenty-three county school systems and Baltimore City constitute a group of districts divergent in socio-economic character, but similar in the nature of their organization for public education. The review of the literature revealed that most studies of teacher mobility are of a survey questionnaire type with little attempt to state and test statistical hypotheses. The present study involves the following procedures in an attempt to assess teacher mobility in the State of Maryland from an objective perspective.

COLLECTION OF THE DATA

The data for the variables were obtained from the organizations listed in Table II.

Table II

SOURCES OF THE DATA FOR THE VARIABLES USED IN THE STUDY

Variable	Source of the data
Teacher withdrawal	Maryland State Department of Education
Cost of living	Department of Labor (BLS), Maryland State Department of Education
Intra-comparability	National Education Association, Maryland State Teachers Association, local school districts
Inter-comparability	Department of Labor (BLS), Maryland State Department of Education
Ability to pay	Maryland State Department of Education, State Department of Assessments and Taxation

The Division of Planning, Research, and Evaluation of the Maryland State Department of Education was the source for most of the data through their publication, Annual Report of the State Board of Education of Maryland (hereinafter referred to as the Annual Report), or through the means of recent releases for data not yet published in the formal report. The State Department of Assessments and Taxation was the source of information on assessments and assessment ratios in the publication, The 27th Biennial Report of the State Department of Assessments and Taxation.

Through the National Education Association and its state affiliate, the Maryland State Teachers Association, salary schedule information was obtained for the intra-comparability variable. The Bureau of Labor Statistics (BLS) of the Department of Labor, through the publications Monthly Labor Review and Area Wage Survey, is the source of data for the cost of living and inter-comparability variables respectively. Lastly, each of the local districts in the State of Maryland provided information, used in the intra-comparability variable, by responding to a short query sent to them in the spring of 1971.

OPERATIONAL DEFINITIONS OF THE VARIABLES

Although the variables have been cursorily defined in the opening chapter, each will be discussed in a more thorough manner to assure understanding of their meaning.

The rationale for the study and its design were based upon the premise that teacher withdrawals are related to four measures of the adequacy of remuneration. The four wage measures, or wage criteria, include the following: 1) Cost of living, 2) Intra-comparability of wages, 3) Inter-comparability of wages, and 4) Ability to pay. Since the four measures would result in values too complex for statistical interpretation, proxy variables were selected to serve as indicators of the four measures. The proxy variables chosen were selected because of their absolute nature and their integral position in the definitions of the wage criteria. All variables, including the proxy variables, are identified in Table III.

Table III

IDENTIFICATION OF VARIABLES USED IN THE STUDY

Variable number	Variable
1	Teacher withdrawal rate
2	Average salary, year t - 1
3	Average salary, year t
4	Consumer Price Index, year t - 1
5	Consumer Price Index, year t
6	District under investigation salary score
7	Prime competitor district salary score
8	Weighted index of average earnings, year t - 1
9	Weighted index of average earnings, year t
10	Average salary, year t - 1
11	Average salary, year t
12	Local revenue raised per pupil belonging
13	True valuation per pupil belonging
14	1960-61
15	1961-62
16	1962-63
17	1963-64
18	1964-65
19	1965-66
20	1966-67
21	1967-68
22	1968-69
23	1969-70
24	SMSA district
25	Non-SMSA district

Two comments should be noted before the variables are defined. One, the operational definitions for some of the variables will differ from those given for the same variables in the private sector due to the nature of public education. Secondly, the definitions for each of the variables will be cast in terms of the State of Maryland from 1960 to 1970 since that political body and time period constitute the space and time dimensions of the study.

Teacher withdrawal

In discussing the dependent variable, teacher withdrawal, this study limits the compilation of the number of withdrawals to those teachers who have indicated a reason for withdrawal which could have been prompted by economic considerations. The Annual Report includes a compilation of the causes reported for withdrawal of teachers. All causes for teacher withdrawal which are included in the Annual Report are listed in two groups in Table IV: 1) Withdrawal causes related to economic factors and included in the count in this study, and 2) All other withdrawal causes which are not included in the study.

Table IV

CAUSES FOR TEACHER WITHDRAWAL IN THE STATE OF MARYLAND

Withdrawal causes included

Resigned due to dissatisfaction with teaching
Teaching in another Maryland local unit
Teaching in another state or country
Teaching in a private school or college
To work somewhere other than teaching
Transfer to an administrative or supervisory position

Withdrawal causes not included

Death
Dismissal
Military service
Other reason or cause unknown
Resigned due to study
Resigned due to moving away
Resigned due to marriage
Resigned due to maternity
Resigned due to home responsibility
Resigned due to personal illness
Retirement

The varying size of staff is compensated for by defining the variable as the number of withdrawals divided by the number of staff, which is also obtained from the Annual Report. The number of withdrawals and the number of staff by school system are given in Appendix I and II. The withdrawal rate for each district (variable 1) is given in Appendix III, Table A.

Even though the review of the literature indicated that economic concerns appeared to be different for males and females in withdrawal decisions, it is not possible to investigate this point since the Maryland State Department of Education does not classify withdrawal data by sex.

Cost of living

The cost of living standard (officially known as the Consumer Price Index for Urban Wage Earners and Clerical Workers) has remained popular as a wage criterion. It is a statistical measure of changes in prices and, for this study, several sets of cost of living figures are used.

Of the 24 districts in the State of Maryland, eight districts are located within the Baltimore, Maryland or Washington, D.C. Standard Metropolitan Statistical Area (SMSA).[1] Since there is a cost of living index unique to each of the Baltimore and Washington SMSA's, each of the school districts within these respective areas will be included under the corresponding cost of living index.

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[1] In 1970 the counties included in the Baltimore SMSA were Anne Arundel, Baltimore, Carroll, Harford, Howard and Baltimore City. The counties included in the Washington, D.C. SMSA were Prince George's and Montgomery.

There is no directly applicable cost of living index for the other 16 school districts not included in an SMSA. The problem of developing a cost of living index for teachers' salaries was raised over 25 years ago by the National Education Association.[2] It was their conclusion that methods for undertaking such a task far exceeded the monies available and that there was reason to doubt that the results of such an endeavor would be worth the costs.

Because of this problem the national index (the U.S. city average,[3] which includes prices from the 23 SMSA's for which separate indices are published in addition to 33 other locations)[4] will be applied to the 16 non-SMSA districts in the State of Maryland. Commenting on this practice over 35 years ago, Walter Eells remarked, "To what extent such a city index may be accepted as a fair measure of the cost of living in the smaller cities and rural districts is unknown".[5] More recently, Leon Keyserling, commenting on the difference between living conditions in metropolitan and non-metropolitan areas, indicated that, "Actually there is not as much difference as usually supposed between the cost of living within these two area classifications".[6]

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[2] Cost of Living Trends--Their Meaning for Teachers (Washington, D.C.: National Education Association, 1945), pp. 15-17.

[3] The Consumer Price Index (Washington, D.C.: The U.S. Department of Labor (BLS), 1967), pp. 3, 8-9.

[4] The additional locations include:

Alabama - Florence
Alaska - Anchorage
California - Bakersfield
Colorado - Denver
Connecticut - Hartford
Florida - Orlando
Indiana - Indianapolis
Indiana - Logansport
Illinois - Champaign
Iowa - Cedar Rapids
Kansas - Wichita
Louisiana - Baton Rouge
Maine - Portland
Mass. - Southbridge
Michigan - Niles
Minnesota - Crookston
Miss. - Vicksburg
New Jersey - Millville
New York - Kingston
North Carolina - Durham
No. Dakota - Devil Lake
Ohio - Dayton
Ohio - Findlay
Oklahoma - Mangum
Oregon - Klamath Fall
Penna. Lancaster
So. Carolina - Union
Tenn. - Nashville
Texas - McAllen
Texas - Austin
Utah - Orem
Va. - Martinsville
Wis. - Green Bay

[5] Walter C. Eells, Teachers Salaries and the Cost of Living, (Stanford, Cal.: Stanford University, 1933), p. 78.

Supportive of the opinion voiced by Keyserling is an analysis of variance performed on the cost of housing (both renter occupied and owner occupied) changes from 1960 to 1970 in the State of Maryland. Utilizing the procedure illustrated in Appendix IV (using data for Allegany County, Maryland) a percentage change in the cost of housing for each of the districts in the State of Maryland can be computed (data for each of the districts in the state is found in Appendix V). The results of this computation for each of the districts in the State is shown in Appendix VI along with a table of means and standard deviations for the metropolitan and non-metropolitan districts. The analysis of variance among those districts within an SMSA and those lying outside an SMSA revealed the non-significant F-ratio shown in Table V. Housing costs are reasonable indicators of differences in

Table V

ANOVA TABLE FOR HOUSING COST CHANGES - 1960 to 1970

	Sum of Squares	DF	Mean square	F-ratio
Between groups	.0061	1	.0061	.5883
Within groups	.2280	22	.0104	
Total	.2341	23		

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[6] Leon Keyserling, Goals for Teaching Salaries in Our Public Schools (Washington, D.C.: Conference on Economic Progress, 1967), P. 20.

the cost of living (both cost of housing and rent properties are included in the development of the Consumer Price Index) among areas. From the analysis of variance one can infer that there is little difference in the change of the cost of living in those districts which lie within an SMSA and those which lie outside an SMSA in the State of Maryland during the period 1960-70.

The manner in which the cost of living wage criterion is statistically used in this study follows from Orlando Furno's[7] use in School Management. Through the use of the "salary deflator index" the effect of inflation on salaries is seen. The deflator, in other words, changes current dollars to constant or 1957-58 dollars. Average salary (average salary data by local unit is given in Appendix III, Table B) for year $t-1$ is divided by the Consumer Price Index for that same year as shown in Figure II (the Consumer Price Index for the U.S. city average, Baltimore, Maryland, and Washington, D.C. is given in Appendix III, Table C). The resultant value in the salary is

Figure II

PROCEDURE FOR COMPUTING THE SALARY DEFLATOR INDEX

$$\frac{S_{t-1}}{C_{t-1}} = D_{t-1} \qquad \frac{S_t}{C_t} = D_t \qquad D_t - D_{t-1} = RSD$$

S = Average salary
C = Consumer Price Index
D = Constant dollars
t = Year under consideration
RSD = Real salary difference

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[7] Orlando Furno, "Determining the Effect of Inflation on Salaries", School Management, X (June, 1966), 15.

constant 1957-58 dollars. The difference in the constant dollar figure from one year to the next is the real salary difference (RSD). Use of the real salary difference as representative of the cost of living wage criterion, however, would present complex interpretive problems as noted earlier. The proxy variables used to represent the cost of living wage criterion in the statistical analysis are: 1) Average salary, year $t-1$ (Variable 2), 2) Average salary, year t (Variable 3), 3) Consumer Price Index, year $t-1$ (Variable 4), and 4) Consumer Price Index, year t (Variable 5).

Comparability of wages

Bullock[8] indicates that the most powerful and persuasive criterion for wage determination in the private sector of the economy is the wage comparison standard.

A fundamental assumption concerning the criterion is that employees make salary comparisons which produce a source of potential discontent. Patchen[9] has supplied empirical evidence which shows that at least certain types of comparisons tend to be dysfunctional. Salary comparisons by teachers are assumed to cause dissatisfaction strong enough to make the teacher leave his or her position.

Wage comparisons may take a number of forms. Since teachers can, and do, look both inwardly to their own occupation as well as outwardly to other occupations when making salary comparisons, the criterion of wage comparability will be analyzed along two dimensions: one, an intra-comparison (i.e., a comparison involving salaries of other school districts) and two, and inter-comparison (i.e., a comparison involving wages paid outside the field of education.

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[8] Paul Bullock, Standards of Wage Determination (Los Angeles: Institute of Industrial Relations, U.C.L.A., 1960), p. 5.

[9] Martin Patchen, The Choice of Wage Comparisons (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1961), pp. 35-48.

Intra-comparability of wages. The variable of intra-comparability is designed to determine the relative position of a district's salary schedule in relation to the salary schedules of other districts with which it competes for the same teacher supply. Yeager,[10] Benson,[11] van Zwoll,[12] and Drummond[13] emphasize the importance of comparing the salary scale of neighboring districts when school districts adopt new pay scales. The competitor districts for each of the 24 local school districts in the State of Maryland was obtained through responses to a letter sent to the administrators in charge of teacher personnel in the local districts (see Appendix VII). The competitor districts are shown in Appendix VIII.

Data for the intra-comparison was obtained by applying the NEA instrument Tests for the Evaluation of School District Policies on Teacher Salaries (1967) to the salary schedules of each of the local school districts. The instrument evaluates salary schedules for classroom teachers by applying five tests to the adequacy of remuneration and five tests to the structure of the schedule with respect to factors such as the recognition of advanced levels of preparation and the number of increments. Each of the ten tests yields a score from 0-100 or a possible total score for the instrument of 1000 points (see Appendix IX for the ten tests included in the instrument).

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[10] William A. Yeager, "Teaching as a Great Profession", Nation's Schools, LVIII (July, 1957), pp. 58-59.

[11] Charles S. Benson, The Economics of Public Education (Boston: Houghton-Mifflin Co., 1961), pp. 418-421.

[12] James A. van Zwoll, School Personnel Administration (New York: Appleton-Century-Crofts, 1964), p. 291.

[13] A.H. Drummond, Jr., "Must They Be Expendable?", School Science and Mathematics, LXIX (March, 1969), 241-246.

Application of the instrument to the variable of intra-comparability begins with the compilation of total scores for the district under investigation for each of the ten years from 1960-61 through 1969-70. Total scores were developed for each district considered by the district under investigation as a competitor for the same teacher supply. The intra-comparability wage criterion is then operationally defined as the relative difference between the total score for the prime competitor and the total score for the district under investigation. Since the relative difference between the total scores for the district is too complex for purposes of statistical interpretation, the wage criterion of intra-comparability is represented by proxy variables. The proxy variables used to represent the intra-comparability wage criterion in the statistical analysis are: 1) Total score for the district under investigation (Variable 6), and 2) Total score for the prime competitor district (Variable 7). Scores for each of the districts involved in the analysis are given in Appendix III, Table D.

Inter-Comparability of wages. Dating back to the National Education Association Convention of 1903[14] educators were concerned with the way in which the income of teachers compared to incomes in other occupations. Benson[15] and van Zwoll[16] are but two of the more current writers to discuss the adequacy of teachers' pay relative to pay in other occupations. In the discussion by van Zwoll it is concluded that comparisons with those possessing comparable qualifications is close to the ideal; comparisons with other professions, comparisons with all wage earners in general, and comparisons with unskilled labor are considered less than ideal.

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[14] "NEA and Teacher Welfare--Economic Status", NEA Journal, XLV (January, 1956), pp. 40-41.

The non-availability of comprehensive data for those possessing comparable qualifications to the teachers in the State of Maryland precludes the favored approach. Data available, however, through the Bureau of Labor Statistics (BLS-Department of Labor) provides as accurate a reading of wage changes as is possible. Through the BLS program of occupational wage surveys in metropolitan areas detailed data is available on occupational earnings. By sampling six broad industry divisions in an area,[17] wage trends for selected occupational groups are developed. These trends are represented by an index of average earnings for a given period of time for the following occupational groups: 1) office clerical workers, 2) industrial nurses, 3) skilled maintenance workers, and 4) unskilled plant workers. By weighting each of the index values in each group by the proportionate number of employees within the group, a weighted index figure is obtained. Weighted index figures are given for each of the areas used in the analysis in Appendix III, Table E.

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[15] Benson, op. cit., pp. 401-405.

[16] van Zwoll, op. cit., pp. 286-291.

[17] The divisions are manufacturing; transportation, communication, and other public utilities; wholesale trades; retail trades; finance, insurance and real estate; and services. Major industrial groups excluded from these studies are government operations and the construction and extractive industries.

The inter-comparability wage criterion is operationally defined as the relative change between the weighted index value for average earnings outside education (from year $t-1$ to year t) and the average salary for teachers in the district under investigation (for the same time period). Once again, the relative change value is too complex for purposes of statistical interpretation and the wage criterion of inter-comparability is represented by proxy variables. The proxy variables used to represent the inter-comparability wage criterion in the statistical analysis are: 1) Weighted index value for earnings outside education, year $t-1$ (Variable 8), 2) Weighted index value for earnings outside education, year t (Variable 9), 3) Average salary, year $t-1$ (Variable 10), and 4) Average salary, year t (Variable 11).

The variable is limited to mean wages/salary figures for two reasons: 1) The area wage survey index values are for average wages, and 2) The salary figures for the teachers in each of the school districts in the State of Maryland are given as mean values.

As indicated above, each of the 24 school districts in the State of Maryland will have its change in average salary related to a weighted index value of average earnings for one of the areas surveyed by the Bureau of Labor Statistics. The selection of the area most applicable to a Maryland school district was made on the basis of: 1) Availability of data for the ten year period, and 2) Proximity to the district. The district and the applicable wage survey are listed in Appendix X .

Ability to pay

Bullock[18] points out that the term "ability to pay" is really a catch-all for the various competitive forces that influence the process of wage determination. Whether or not the financial condition of the employer is an immediate or direct issue in negotiations, the economic status of the employer remains an important consideration of both parties. While it probably never determines the precise wage adjustment to be made, the ability to pay criterion helps to set a range within which bargaining occurs.

Though the profit motive is not inherently part of the public sector (as contrasted with private business and industry), the ability to pay criterion appears equally important to public wage determination in that it provides a measure of a school district's ability to pay for services. Various ways have been devised to measure ability to pay for education.[19] For the purpose of this study the ability to pay for education wage criterion is operationally defined as the absolute level of the revenue raised locally for current expenses to the local revenue base represented by property valuation.[20] This particular definition was chosen in that the property tax in the State of Maryland provides a substantial portion of the local funds used for public education. It is recognized, however, that this choice will limit the generality of the ability to pay criterion.

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[18] Bullock, op. cit., p. 32.

[19] "Five Ways to Measure Local Effort", School Management, XIV (January, 1970), pp. 84-93.

[20] Moehlman, op. cit., p. 187: G. Alan Hickrod, "Ecological Changes Within a School District and Expenditures for Education", American Educational Research Journal, IV (May, 1967) pp. 241-251; R.L. Johns and R.B. Kimbrough, The Relationship of Socioeconomic Factors, Educational Leadership Patterns, and Elements of Community Power Structure to Local Fiscal Policy, Washington, D.C.: U.S. Office of Education (1968), nr. 2842.

In the case of a value to represent the revenue raised locally, the Annual Report provides figures for the amount of funds raised locally for current expenses per pupil belonging (see Appendix III, Table F for the revenue raised locally for current expenses per pupil belonging for each local unit). The revenue base figure requires the conversion of the assessed valuation figure (which is obtained from the Annual Report) to true valuation per pupil belonging through the means of the real property assessment level ratio (see Appendix XI for the real property assessment level ratio for each district and Appendix III, Table G for the true valuation per pupil belonging). Use of the absolute level value as representative of the ability to pay wage criterion, however, would present problems in interpretation as noted earlier for the other wage criteria. The proxy variables used to represent the ability to pay wage criterion in the statistical analysis are: 1) Revenue raised locally for current expenses per pupil belonging (Variable 12), and 2) True valuation per pupil belonging (Variable 13).

Type of school district

An additional concern of this study is the relationship of the economic criteria and teacher withdrawal in school districts considered metropolitan and non-metropolitan. As a result of this concern, the type of school district will be entered into the analysis as an additional independent variable. The 24 local school districts are divided into two groups, metropolitan and non-metropolitan, on the basis of criteria established by the Bureau of the Budget (BOB) in defining standard metropolitan statistical areas.[21] The division of the local school districts in the State of Maryland is given in Table VI.

Table VI

CLASSIFICATION OF SCHOOL DISTRICTS IN THE STATE OF MARYLAND ON THE BASIS OF CRITERIA ESTABLISHED BY BOB

Metropolitan districts	Non-metropolitan districts	
Anne Arundel	Allegany	Kent
Baltimore City	Calvert	Queen Anne
Baltimore	Caroline	St. Mary
Carroll	Cecil	Somerset
Harford	Charles	Talbot
Howard	Dorchester	Washington
Montgomery	Frederick	Wicomico
Prince George's	Garrett	Worcester

ANALYSIS OF THE DATA

After completing the preliminary compilations, several analyses were completed utilizing the computer services of the IBM 1108 computer located at the University of Maryland Computer Science Center, College Park, Maryland.

The following variables, both continuous and categorical, were represented for statistical analysis on the same data card: 1) Teacher withdrawal, 2) Cost of living, 3) Intra-comparability,

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[21] Standard Metropolitan Statistical Areas (Washington, D.C.: Bureau of the Budget, 1964), pp. 1-3.

4) Inter-comparability, 5) Ability to pay, 6) Year, and 7) Type of district. The teacher withdrawal value was used as the dependent variable. The independent variables of cost of living, inter-comparability, intra-comparability, and ability to pay were represented by various combinations of proxy variables (for a full description of the variables and their coding see Appendix XII). The variable, years, though not part of the hypothetical framework of the study serves to indicate whether or not the factor of time has a measurable effect on the relationship for the time period under investigation--it is presumed that this variable will not have a measurable effect on the relationship.

In coding the categorical data a "1" was placed in a vector when a district possessed that trait and a "0" when that district did not possess that trait. Therefore, the year and type of district variables are numbered as either "1" or "0".

STATISTICAL DESIGN

A multiple linear regression computer program[22] was the statistical technique used to analyze the data. Through the use of this technique the contribution of a set of variables to prediction is measured by the difference between two coefficients of multiple determination (RSQ). One coefficient of multiple determination is obtained for a regression equation in which all variables are used;

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[22] Robert Gelina, Applied Multiple Linear Regression, College of Education, University of Maryland, Bureau of Educational Research and Field Services, 1970.

called the full model (FM). The other coefficient of multiple determination is obtained for a regression equation in which a variable or set of variables under consideration have been deleted; called the restricted model (RM).

The difference between the full model and the restricted model represents the proportion of variance in the dependent variable which has been mathematically accounted for by the variables deleted. This difference can be tested for statistical significance through the use of the variance ratio test. The null hypothesis tested essentially states that the variables deleted contribute nothing to the prediction of the dependent variable that is not already in the restricted model.

The statistical testing will proceed through four sections. The first section involves the measurement of the degree of relationship existent between the economic criteria and teacher withdrawal for the 24 school districts in the State of Maryland during the period 1960-70. Multiple linear regression analysis is used to determine the amount of variance in teacher withdrawal (the dependent variable) which can be accounted for by the independent variables of cost of living, intra-comparability, inter-comparability, and ability to pay. The variance ratio test is used to determine the statistical significance of the "variance explained" by these four variables taken in the aggregate.

The second section is concerned with the amount of contribution each of the four wage criteria make to the prediction of teacher withdrawal separately. If it is found that there is a significant difference in the prediction of teacher withdrawal when a given wage criterion is deleted from a full set of economic factors, then that criterion is considered a significant predictor. The variance ratio test is used to test for the significance of the unique contribution of each of the criterion.

Section three involves the determination of whether or not the type of district makes a difference in the prediction of the dependent variable from the four independent variables representing economic concerns. Multiple linear regression analysis and the variance ratio test are also used at this step of the analysis.

The last section is concerned with the way in which each of the wage criterion predicts withdrawal in the two types of districts. The same procedure outlined in step two is performed on the data for the metropolitan and non-metropolitan districts separately. The variance ratio test is used to test for the significance of the individual contribution of each of the wage criterion.

CHAPTER IV

FINDINGS

The findings of the regression analysis are described in the following four sections: 1) The degree of relationship existent between economic concerns and teacher withdrawal for the school districts in the State of Maryland, 2) The contribution each of the four wage criteria make to the prediction of teacher withdrawal in the school districts of the State of Maryland. The findings pertinent to these two sections will answer the first set of five questions posed in the Chapter of Introduction. In addition, the findings presented under the following two sections will answer the second set of five questions postulated in Chapter I: 3) The degree of relationship existent between economic concerns and teacher withdrawal a) for metropolitan districts, and b) for non-metropolitan districts in the State of Maryland, and 4) The contribution each of the four wage criteria make to the prediction of teacher withdrawal a) for metropolitan districts, and b) for non-metropolitan districts in the State of Maryland.

For each of the sections several questions are identified to provide a framework for testing. Intercorrelation matrices (where applicable), coefficients of multiple determination (RSQ), coefficients of multiple correlation (R), and the unique contribution proportion each of the restricted models makes toward prediction of the dependent variable are given in tabular form. The unique contribution proportion each of the restricted models makes toward the prediction of the dependent variable is tested for significance utilizing Snecedor's variance ratio test.[1] The null hypothesis tested states that the variables deleted from the full model (FM) contribute nothing to the prediction of the criterion variable that is not already in the restricted model (RM).

$$H_0 : \overline{RSQ}_{FM} - \overline{RSQ}_{RM} = 0$$

The coefficients of multiple correlation are tested for significance utilizing a modification of the variance ratio test by Hayes.[2] The null hypothesis tested states that the multiple correlation (R) derived is no different from zero.

$$H_0 : \bar{R} = 0$$

Section I

The degree of relationship existent between economic concerns and teacher withdrawal for the school districts of the State of Maryland

An intercorrelation matrix of the 24 predictor variables and the criterion variable is given in Table VII for the school districts of Maryland. The product-moment correlations and their significance

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[1] George W. Snecedor and George C. Cochran, Statistical Methods (Ames, Iowa: The Iowa State University, 1967), pp. 265-267.

[2] William L. Hayes, Statistics (New York: Holt, Rinehart, and Winston, 1963), p. 573.

TABLE VII

INTERCORRELATION MATRIX OF THE CRITERION VARIABLE (TEACHER WITHDRAWAL - 1)
AND THE PREDICTOR VARIABLES (2-25) FOR THE STATE OF
MARYLAND, 1960 TO 1970 (N = 240)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Teacher withdrawal rate	(1)	1.0																								
Average salary, year t - 1	(2)	-.17[a]	1.0																							
Average salary, year t	(3)	-.18[a]	.96	1.0																						
Consumer price index, year t - 1	(4)	.05	.87	.88	1.0																					
Consumer price index, year t	(5)	.05	.87	.88	.99	1.0																				
District salary score	(6)	-.23[a]	.85	.87	.73	.74	1.0																			
Competitor district salary score	(7)	-.06	.73	.74	.75	.76	.74	1.0																		
Average earnings index, year t - 1	(8)	.07	.86	.87	.97	.97	.73	.79	1.0																	
Average earnings index, year t	(9)	.07	.86	.87	.97	.97	.76	.80	.99	1.0																
Average salary, year t - 1	(10)	-.17[a]	1.0	.96	.87	.81	.85	.73	.86	.86	1.0															
Average salary, year t	(11)	-.18[a]	.96	1.0	.88	.88	.87	.74	.87	.87	.96	1.0														
Local revenue per pupil	(12)	-.23[a]	.83	.84	.67	.67	.81	.76	.68	.69	.83	.84	1.0													
True valuation per pupil	(13)	-.10	.51	.52	.41	.41	.46	.59	.40	.40	.51	.52	.79	1.0												
1960-61	(14)	-.05	-.40	-.37	-.38	-.36	-.28	-.26	-.44	-.41	-.40	-.37	-.25	-.12	1.0											
1961-62	(15)	-.10	-.31	-.30	-.32	-.33	-.24	-.26	-.35	-.35	-.31	-.30	-.23	-.09	-.11	1.0										
1962-63	(16)	.04	-.23	-.26	-.28	-.27	-.22	-.22	-.28	-.27	-.23	-.26	-.18	-.16	-.11	-.11	1.0									
1963-64	(17)	.02	-.19	-.21	-.20	.23	-.18	-.21	-.19	-.20	-.19	-.21	-.14	-.13	-.11	-.11	-.11	1.0								
1964-65	(18)	-.07	-.13	-.06	-.15	-.17	-.11	-.12	-.10	-.12	-.13	-.06	-.12	-.08	-.11	-.11	-.11	-.11	1.0							
1965-66	(19)	.08	.05	-.03	-.08	-.03	-.03	-.04	-.01	-.04	.05	-.03	-.04	-.03	-.11	-.11	-.11	-.11	-.11	1.0						
1966-67	(20)	.07	.08	.06	.10	.05	.02	.04	.08	.08	.08	.06	.07	.07	-.11	-.11	-.11	-.11	-.11	-.11	1.0					
1967-68	(21)	.06	.18	.23	.20	.21	.21	.21	.23	.26	.18	.24	.15	.13	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0				
1968-69	(22)	-.08	.38	.39	.41	.45	.37	.39	.42	.43	.38	.39	.31	.19	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0			
1969-70	(23)	.03	.56	.56	.70	.68	.46	.47	.63	.62	.56	.56	.44	.25	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0		
SMSA district	(24)	-.37[a]	.23	.23	-.01	-.01	.42	.33	.06	.07	.23	.23	.41	.24	0	0	0	0	0	0	0	0	0	0	1.0	
Non-SMSA district	(25)	.37[a]	-.23	-.23	.01	.01	-.42	-.33	-.06	-.07	-.23	-.23	-.41	-.24	0	0	0	0	0	0	0	0	0	0	0	1.0

a: significant beyond the .01 level.

with the criterion variable are shown in Column 1 of Table VII.[3] In order of correlation with the criterion variable, first is the type of district variable (Variable 24 or 25); Tied for second are the economic proxy variables representing the salary score for the district under investigation (Variable 6) and local revenue raised per pupil belonging (Variable 12); Third is the economic proxy variable representing average teacher salary, year t (Variable 3 or 11); Fourth is the economic proxy variable representing average teacher salary, year t - 1 (Variable 2 or 10). While these five variables have significant correlations with the criterion variable,[4] the correlations are generally low. The regression coefficients (b), entry level of the variables, unit vector weight (c), and standard error of estimate (e) for the multiple regression analysis containing variables two through 25 are given in Table VIII.

The research question which provides the basis of investigation for this section is as follows:

What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by economic concerns (Variables 2-13) in a regression model containing twelve other variables (Variables 14-25) representing years and type of district?

$$\text{FM: } X_1 = c + b_2X^2 + b_3X^3 + b_4X^4 + b_5X^5 + b_6X^6 + b_7X^7 + B_8X^8 + b_9X^9 + b_{10}X^{10} + b_{11}X^{11} + b_{12}X^{12} + b_{13}X^{13} + \ldots + b_{25}X^{25} + e$$

$$\text{RM: } X_1 = c + b_{14}X^{14} + b_{15}X^{15} + \ldots + b_{25}X^{25} + e$$

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[3] Significance levels obtained from George W. Snecedor and George W.Cochran, op. cit., Table All, p. 557.

[4] Variables 3 and 10 and variables 4 and 11 were counted together since they are identical. In the discussion concerning the RM in Sections II, and IV it should be noted that these variables are restricted together.

Table VIII

Regression weights, entry level, unit vector weight, standard error of estimate for the multiple regression analysis containing variables 2-25 (N = 240)

Variable	Regression weight (b)	Entry level
2	-.0000	15
3	-.0000	2
4	.0000	0
5	.0015	21
6	-.0000	18
7	-.0000	17
8	.0011	3
9	.0009	19
10	.0000	0
11	.0000	0
12	-.0000	14
13	.0000	5
14	.0095	13
15	.0034	6
16	.0124	12
17	.0055	16
18	-.0040	7
19	.0041	9
20	-.0046	11
21	-.0147	10
22	-.0364	4
23	-.0404	8
24	.0003	20
25	.0107	1

Unit vector weight = -.2328 (c)

Standard error of estimate = .0238 (e)

To determine an answer to this question it was first necessary to develop a multiple regression equation using the 24 predictor variables to predict teacher withdrawal (the FM). About 34 percent (.3422) of the total criterion variance is accounted for by the full model as shown in Table IX. A multiple correlation using the composite as a predictor of teacher withdrawal was .5850 which is significant at the .01 level.

In the restricted model (RM), a twelve variable composite was tested for predictability in which all of the economic proxy variables (Variables 2-13) were deleted from the full regression model. About 18 percent (.1768) of the criterion variance was attributed to the twelve variables representing years and type of district (Variables 14-25) as shown in Table IX. The difference between the total contribution value for the full model (.3422) and the total contribution value for the restricted model (.1768) yields an estimate of .1654 for the unique contribution of the economic proxy variables. The variance ratio test indicates that this contribution is significant at the level shown in Table IX.

Table IX

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by economic concerns (Variables 2-13) in a regression model containing twelve other variables (Variables 14-25) representing years and type of district?

	RSQ	R	Unique contribution of variable 2-13	Sig. level
FM: 2-25	.3422	.5850[a]	.1654	< .00005
RM: 14-25	.1768	.4205[a]		

a: significant at .01 level

A question which arose as a result of the manner in which the data were accumulated has to do with the effect the variable of time, or years, had on the prediction of teacher withdrawal. In Chapter III it was presumed that this variable would not have a measurable effect on the relationship for the period under investigation. To test the accuracy of this presumption, the following question was posed:

What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by years (Variables 14-23) in a regression model containing fourteen other variables (Variables 2-13 and 24 and 25) representing economic concerns and type of district?

In the restricted model, a fourteen variable composite was tested for predictability in which all of the variables representing years (Variables 14-23) were deleted from the full regression model. About 31 percent (.3112) of the criterion variance was attributed to the fourteen variables (Variables 2-13, 24, 25) representing economic concerns and type of district as shown in Table X. The difference between the total contribution value for the full model (.3422) and the total contribution value for the restricted model (.3112) yields an estimate of .0310 for the unique contribution of the variables representing years. The variance ratio test indicates that this contribution is not significant at the .05 level.

Table X

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by years (Variables 14-23) in a regression model containing fourteen other variables (Variables 2-13, 24, 25) representing economic concerns and type of district?

	RSQ	R	Unique contribution Variable 14-23	Sig. level
FM: 2-25	.3422	.5850[a]		
RM: 2-13, 24, 25	.3112	.5578[a]	.0310	.3704
a: significant at .01 level				

Section II

The contribution each of the four wage criteria make to the prediction of teacher withdrawal in the school districts of the State of Maryland

In section I it was noted that four of the ten economic proxy variables had product-moment correlations significantly different from zero. Though some correlation was obtained for each of the other economic proxy variables, these values do not differ significantly from zero. The product-moment correlations, however, do not provide a complete answer to the question of which of the four wage criteria make a significant contribution to the prediction of teacher withdrawal. By asking a series of questions concerning the contribution each of the wage criteria make to the prediction of teacher withdrawal an answer will be obtained relative to the significance of the individual contributions.

What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the cost of living wage criterion (Variables 2-5,10,11) in a regression model containing eighteen other variables (Variables 6-9, 12-25) representing the wage criteria of intra-comparability, inter-comparability, ability to pay, the type of district, and years?

In the restricted model an eighteen variable composite was tested for predictability in which the proxy variables defined as the cost of living wage criterion (2-5, 10, 11) were deleted from the full regression model. About 31 percent (.3074) of the criterion variance was attributed to the eighteen variables representing the other wage criteria, type of district, and years as shown in Table XI. The difference between the total contribution value for the full model (.3422) and the total contribution for the restricted model (.3074) yields an estimate of .0349 for the unique contribution of the cost of living wage criterion. The variance ratio test shows that this contribution is not significant at the .05 level.

Table XI

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the cost of living wage criterion (Variables 2-5, 10,11) in a regression model containing eighteen other variables (Variables 6-9, 12-25) representing the wage criteria of intra-comparability, inter-comparability, ability to pay, the type of district, and years?

	RSQ	R	Unique contribution of Var. 2-5, 10, 11	Sig. level
FM: 2-25	.3422	.5850[a]	.0349	.0808
RM: 6-9, 12-25	.3074	.5544[a]		
a: significant at .01 level				

What percentage of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the intra-comparability wage criterion (Variables 6-7) in a regression model containing twenty-two other variables (Variables 2-5, 8-25) representing the wage criteria of cost of living, inter-comparability, ability to pay, the type of district, and years?

In the restricted model a twenty-two variable composite was tested for predictability in which the proxy variables defined as the intra-comparability wage criterion (6-7) were deleted from the full regression model. About 34 percent (.3406) of the criterion variance was attributed to the twenty-two variables representing the other wage criteria , type of district, and years as shown in Table XII. The difference between the total contribution value for the full model (.3422) and the total contribution value for the restricted model (.3406) yields an estimate of .0016 for the unique contribution of the intra-comparability wage criterion. The variance ratio test shows that this contribution is not significant at the .05 level.

Table XII

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the intra-comparability wage criterion (Variables 6-7) in a regression model containing twenty-two other variables (Variables 2-5, 8-25) representing the wage criteria of cost of living, inter-comparability, ability to pay, the type of district, and years?

	RSQ	R	Unique contribution of variables 6-7	Sig. level
FM: 2-25	.3422	.5850[a]	.0016	.7661
RM: 2-5, 8-25	.3406	.5836[a]		
a: significant at .01 level				

What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the inter-comparability wage criterion (Variables 2, 3, 8-11) in a regression model containing eighteen other variables (Variables 4-7, 12-25) representing the wage criteria of cost of living, intra-comparability, ability to pay, the type of district and years?

In the restricted model an eighteen variable composite was tested for predictability in which the proxy variables defined as the inter-comparability wage criterion (2, 3, 8-11) were deleted from the full regression model. About 25 percent (.2511) of the criterion variance was attributed to the other eighteen variables representing the other wage criteria , type of district, and years as shown in Table XIII. The difference between the total contribution value for the full model (.3422) and the total contribution value for the restricted model (.2511) yields an estimate of .0912 for the unique contribution of the inter-comparability wage criterion. The variance ratio test indicates that this contribution is significant at the level shown in Table XIII.

Table XIII

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the inter-comparability wage criterion (Variables 2, 3, 8-11) in a regression model containing eighteen other variables (Variables 4-7, 12-25) representing the wage criteria of cost of living, intra-comparability, ability to pay, the type of district, and years?

	RSQ	R	Unique contribution of var. 2, 3, 8-11	Sig. level
FM: 2-25	.3422	.5850[a]		
RM: 4-7, 12-25	.2511	.5011[a]	.0912	.0001
a: significant at the .01 level				

What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the ability to pay wage criterion (Variable 12-13) in a regression model containing twenty-two other variables (Variables 2-11, 14-25) representing the wage criteria of cost of living, intra-comparability, inter-comparability, the type of district, and years?

In the restricted model a twenty-two variable composite was tested for predictability in which the proxy variables defined as the ability to pay wage criterion were deleted from the full regression model. About 33 percent (.3300) of the criterion variance was attributed to the twenty-two variables representing the other wage criteria, type of district, and years as shown in Table XIV. The difference between the total contribution value for the full model (.3422) and the total contribution value for the restricted model (.3300) yields an estimate of .0122 for the unique contribution of the ability to pay wage criterion. The variance ratio test indicates that this contribution is not significant at the .05 level.

Table XIV

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the ability to pay wage criterion (Variables 12-13) in a regression model containing twenty-two other variables (Variables 2-11, 14-25) representing the wage criteria of cost of living, intra-comparability, inter-comparability, the type of district, and years?

	RSQ	R	Unique contribution of var. 12-13	Sig. level
FM: 2-25	.3422	.5850[a]		
RM: 2-11, 14-25	.3300	.5745[a]	.0122	.1365

a: significant at the .01 level

Section III

The degree of relationship existent between economic concerns and teacher withdrawal a) for metropolitan districts, and b) for non-metropolitan districts in the State of Maryland

Preliminary to analyzing the degree of relationship existent between economic concerns and teacher withdrawal for the metropolitan and non-metropolitan districts separately it is necessary to ask the following question:

What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the type of district (Variables 24-25) in a regression model containing twenty-two other variables (Variables 2-23) representing economic concerns and years?

Through an answer to this question it will be possible to determine what impact type of district has on the relationship postulated between teacher withdrawal and economic concerns for the State of Maryland as a whole.

In the restricted model a twenty-two variable composite was tested for predictability in which the variables representing type of district (Variables 24 and 25) were deleted from the full regression model. About 33 percent (.3335) of the criterion variance was attributed to the twenty-two variables representing economic concerns and years as shown in Table XV. The difference between the total contribution value for the full model (.3422) and the total contribution value for the restricted model (.3335) yields an estimate of .0087 for the unique contribution of the type of district variables. The variance ratio test indicates that this contribution is not significant at the .05 leve.

Table XV

Question: What percent of variance in teacher withdrawal in the State of Maryland (Variable 1) is uniquely accounted for by the type of district (Variables 24-25) in a regression model containing twenty-two other variables (Variables 2-23) representing economic concerns and years?

	RSQ	R	Unique contribution of var. 24-25	Sig. level
FM: 2-25	.3422	.5850[a]	.0087	.1725
RM: 2-23	.3335	.5775[a]		
a: significant at the .01 level				

Though the significance level of this contribution is not considered high, it indicates that a separate analysis of the two types of districts may indicate some differences in the relationships. In the case of the metropolitan districts eight districts will be subjected to a regression analysis for the ten year period 1960-1970 (N = 80); Sixteen non-metropolitan districts will be similarly analyzed over the same time period (N = 160).

An intercorrelation matrix of the 22 independent variables and the criterion variable is given in Table XVI for the metropolitan school districts in the State of Maryland. The product-moment correlations and their significance with the criterion variable are shown in Column 1 of Table XVI. In order of correlation with the criterion variable, first is the economic proxy variable, local revenue raised per pupil belonging (Variable 12); Second is the economic proxy variable, true valuation per pupil belonging (Variable 13); Third is the economic proxy variable, average salary, year $t-1$ (Variable 2 or 10); Fourth

TABLE XVI

INTERCORRELATION MATRIX OF THE CRITERION VARIABLE (TEACHER WITHDRAWAL - 1) AND THE PREDICTOR VARIABLES (2-23) FOR THE METROPOLITAN DISTRICTS IN THE STATE . OF MARYLAND, 1960 to 1970 (N = 80)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Teacher withdrawal rate	1	1.0																						
Average salary, year t - 1	2	-.38[a]	1.0																					
Average salary, year t	3	-.35[a]	.98	1.0																				
Consumer price index, year t - 1	4	-.12	.88	.90	1.0																			
Consumer price index, year t	5	-.12	.88	.90	.99	1.0																		
District salary score	6	-.30[a]	.89	.91	.82	.83	1.0																	
Competitor district salary score	7	-.19	.78	.81	.89	.90	.72	1.0																
Average earnings index, year t - 1	8	-.10	.88	.89	.99	.98	.82	.90	1.0															
Average earnings index, year t	9	-.10	.88	.90	.99	.99	.83	.90	.99	1.0														
Average salary, year t - 1	10	-.38[a]	1.0	.98	.88	.88	.89	.78	.88	.88	1.0													
Average salary, year t	11	-.35[a]	.98	1.0	.90	.90	.91	.81	.89	.90	.98	1.0												
Local revenue per pupil	12	-.51[a]	.91	.90	.73	.73	.85	.70	.72	.72	.90	.90	1.0											
True valuation per pupil	13	-.40[a]	.69	.67	.45	.45	.64	.40	.44	.45	.69	.67	.85	1.0										
1960-61	14	.04	-.39	-.35	-.38	-.35	-.31	-.29	-.44	-.42	-.39	-.35	-.28	-.18	1.0									
1961-62	15	-.14	-.29	-.29	-.31	-.34	-.29	-.32	-.35	-.36	-.29	-.29	-.24	-.14	-.11	1.0								
1962-63	16	.15	-.23	-.24	-.29	-.27	-.25	-.24	-.29	-.28	-.23	-.24	-.19	-.15	-.11	-.11	1.0							
1963-64	17	.01	-.16	-.20	-.21	-.22	-.22	-.23	-.20	-.20	-.16	-.20	-.16	-.13	-.11	-.11	-.11	1.0						
1964-65	18	-.03	-.12	-.13	-.15	-.17	-.12	-.13	-.11	-.13	-.12	-.13	-.13	-.07	-.11	-.11	-.11	-.11	1.0					
1965-66	19	.03	-.03	-.05	-.08	-.03	0	-.08	-.02	-.04	-.03	-.05	-.02	0	-.11	-.11	-.11	-.11	-.11	1.0				
1966-67	20	.08	.06	.05	.11	.04	.08	0	.08	.09	.06	.05	.10	.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0			
1967-68	21	.04	.19	.23	.19	.21	.22	.26	.23	.28	.19	.23	.12	.13	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0		
1968-69	22	-.06	.40	.38	.40	.45	.39	.46	.45	.44	.40	.38	.32	.19	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0	
1969-70	23	-.13	.57	.59	.71	.69	.49	.57	.63	.62	.57	.59	.48	.25	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0

[a] significant beyond .01 level.

is the economic proxy variable, average salary, year t (Variable 3 or 11); Fifth is the economic proxy variable, salary score for the district under investigation (Variable 6). The regression coefficients (b), entry level of the variables, unit vector weight (c), and standard error of estimate (e) for the multiple regression analysis containing variables two through 23 for the metropolitan districts in the State of Maryland are given in Table XVII.

One of the research questions which provides the basis of investigation for this section is as follows:

What percent of variance in teacher withdrawal in the metropolitan districts of the State of Maryland (Variable 1) is uniquely accounted for by economic concerns (Variables 2-13) in a regression model containing ten other variables (Variables 14-23) representing years?

To determine an answer to this question it was first necessary to develop a multiple linear regression equation, using the 22 independent variables, to predict teacher withdrawal for the metropolitan districts in the State of Maryland (the FM). About 59 percent (.5911) of the total criterion variance is attributed to the full model as shown in Table XVIII. A multiple correlation using the composite as a predictor of teacher withdrawal was .7688 which is significant at the .01 level.

In the restricted model (RM), a ten variable composite was tested for predictability in which all of the economic proxy variables (Variables 2-13) were deleted from the full regression model. About seven percent (.0683) of the total criterion variance was attributed to the ten variables representing years as shown in Table XVIII. The difference between the total contribution value for the full model (.5911) and the total contribution value for the restricted model

Table XVII

Regression weights, entry level, unit vector weight, standard error of estimate for the multiple regression analysis containing variables 2-23 (N = 80)

Variable	Regression weight (b)	Entry level
2	-.0000	9
3	.0000	17
4	-.0002	15
5	.0000	0
6	.0000	10
7	-.0000	11
8	-.0022	18
9	.0031	2
10	.0000	0
11	.0000	0
12	-.0002	1
13	.0000	3
14	.0033	6
15	-.0018	12
16	.0129	4
17	.0066	8
18	.0029	19
19	.0085	7
20	.0094	5
21	-.0007	14
22	.0087	13
23	.0107	16

Unit vector weight = -.0195 (c)

Standard error of estimate = .0122 (e)

(.0683) yields an estimate of .5228 for the unique contribution of the economic proxy variables. The variance ratio test indicates that this contribution is significant at the level shown in Table XVIII.

Table XVIII

Question: What percent of variance in teacher withdrawal in the metropolitan districts of the State of Maryland (Variable 1) is uniquely accounted for by economic concerns (Variables 2-13) in a regression model containing ten other variables (Variables 14-23) representing years?

	RSQ	R	Unique contribution of var. 2-13	Sig. level
FM: 2-23	.5911	.7688[a]		
RM: 14-23	.0683	.2614[a]	.5228	< .00005
a: significant at the .01 level				

An intercorrelation matrix of the 22 predictor variables and the criterion variable is given in Table XIX for the non-metropolitan school districts in the State of Maryland. The product-moment correlations and their significance with the criterion variable are shown in Column 1 of Table XIX. None of the product-moment correlations between the independent variables and teacher withdrawal differed significantly from zero. The regression coefficients (b), entry level of the variables, unit vector weight (c), and standard error of estimate (e) for the multiple regression analysis containing variables two through 23 for the non-metropolitan districts in the state of Maryland are given in Table XX. A question, similar to the question raised for the metropolitan districts, is therefore raised:

TABLE XIX

INTERCORRELATION MATRIX OF THE CRITERION VARIABLE (TEACHER WITHDRAWAL - 1) AND THE PREDICTOR VARIABLES (2-23) FOR THE NON-METROPOLITAN DISTRICTS IN THE STATE OF MARYLAND, 1960 to 1970 (N = 160)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Teacher withdrawal rate	1	1.0																						
Average salary, year t - 1	2	-.01	1.0																					
Average salary, year t	3	-.03	.95	1.0																				
Consumer price index, year t - 1	4	.10	.91	.91	1.0																			
Consumer price index, year t	5	.10	.91	.92	.99	1.0																		
District salary score	6	-.02	.83	.86	.84	.84	1.0																	
Competitor district salary score	7	.15	.68	.69	.76	.77	.72	1.0																
Average earnings index, year t - 1	8	.17	.87	.87	.96	.96	.81	.78	1.0															
Average earnings index, year t	9	.17	.86	.87	.96	.96	.81	.79	.99	1.0														
Average salary, year t - 1	10	-.01	1.0	.95	.91	.91	.83	.68	.87	.86	1.0													
Average salary, year t	11	-.03	.95	1.0	.91	.92	.86	.69	.87	.87	.95	1.0												
Local revenue per pupil	12	.06	.77	.79	.76	.76	.69	.75	.74	.74	.77	.79	1.0											
True valuation per pupil	13	.07	.42	.43	.42	.42	.32	.61	.39	.38	.42	.43	.79	1.0										
1960-61	14	-.09	-.43	-.41	-.38	-.37	-.31	-.27	-.44	-.41	-.43	-.41	-.28	-.12	1.0									
1961-62	15	-.10	-.33	-.32	-.33	-.32	-.26	-.26	-.35	-.34	-.33	-.32	-.26	-.08	-.11	1.0								
1962-63	16	.01	-.24	-.29	-.27	-.27	-.24	-.23	-.27	-.27	-.24	-.29	-.21	-.17	-.11	-.11	1.0							
1963-64	17	.02	-.21	-.23	-.20	-.23	-.20	-.22	-.18	-.19	-.21	-.23	-.15	-.14	-.11	-.11	-.11	1.0						
1964-65	18	-.09	-.14	-.02	-.16	-.17	-.13	-.12	-.10	-.11	-.14	-.02	-.14	-.09	-.11	-.11	-.11	-.11	1.0					
1965-66	19	.11	.10	-.02	-.08	-.04	-.05	-.02	0	-.04	.10	-.02	-.06	-.04	-.11	-.11	-.11	-.11	-.11	1.0				
1966-67	20	.08	.09	.07	.09	.05	-.02	.06	.08	.08	.09	.07	.05	.06	-.11	-.11	-.11	-.11	-.11	-.11	1.0			
1967-68	21	.07	.19	.25	.21	.22	.25	.21	.22	.25	.19	.25	.19	.13	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0		
1968-69	22	-.09	.39	.41	.42	.44	.43	.39	.41	.43	.39	.41	.36	.20	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0	
1969-70	23	.08	.58	.56	.70	.68	.53	.47	.62	.62	.58	.56	.49	.26	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	1.0

Table XX

Regression weights, entry level, unit vector weight, standard error of estimate for the multiple regression analysis containing variables 2-23 (N = 160)

Variable	Regression weight (b)	Entry level
2	-.0000	10
3	-.0000	2
4	.0001	16
5	.0004	15
6	-.0000	14
7	.0000	19
8	.0019	1
9	-.0002	18
10	.0000	0
11	.0000	0
12	.0000	13
13	.0000	4
14	-.0058	11
15	-.0060	9
16	.0030	8
17	.0000	0
18	-.0054	12
19	.0149	5
20	.0066	7
21	.0057	6
22	-.0106	3
23	.0002	17

Unit vector weight = -.0487 (c)

Standard error of estimate = .0278 (e)

What percent of variance in teacher withdrawal in the non-metropolitan districts of the state of Maryland (Variable 1) is uniquely accounted for by economic concerns (Variables 2-13) in a regression model containing ten other variables (Variables 14-23) representing years?

To determine an answer to this question it was necessary to develop a multiple linear regression equation, using the 22 independent variables, to predict teacher withdrawal for the non-metropolitan districts in the state of Maryland (the FM). About 23 percent (.2262) of the total criterion variance is attributed to the full model as shown in Table XXI. A multiple correlation using the composite as a predictor of teacher withdrawal was .4756 which is significant as the .05 level.

In the restricted model (RM) a ten variable composite was tested for predictability in which all of the economic proxy variables (Variables 2-13) were deleted from the full regression model. About six percent (.0594) of the total criterion variance was attributed to the ten variables representing years as shown in Table XXI. The difference between the total contribution value for the full model (.2262) and the total contribution value for the restricted model (.0594) yields an estimate of .1668 for the unique contribution of the economic proxy variables. The variance ratio test indicates that this contribution is significant at the level shown in Table XXI.

Table XXI

Question: What percent of variance in teacher withdrawal in the non-metropolitan districts of the State of Maryland (Variable 1) is uniquely accounted for by economic concerns (Variables 2-13) in a regression model containing ten other variables (Variables 14-23) representing years?

	RSQ	R	Unique contribution of var. 2-13	Sig. level
FM: 2-23	.2262	.4756[b]		
RM: 14-23	.0594	.2437	.1668	.0057

b: significant at the .05 level

Section IV

The contribution each of the four wage criteria make to the prediction of teacher withdrawal a) for metropolitan districts, and b) for non-metropolitan districts in the State of Maryland

As was noted earlier, the product-moment correlations between the various economic proxy variables and the criterion variable do not provide a complete answer to the question of which of the four economic wage criterion make a significant contribution to the prediction of teacher withdrawal. A series of questions, similar to those posed in Section II, therefore will be identified for both the metropolitan group of school districts and the non-metropolitan group of school districts to obtain an answer to the following type of question:

What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the cost of living wage criterion (Variables 2-5, 10, 11) in a regression model containing sixteen other variables (Variables 6-9, 12-23) representing the wage criteria of intra-comparability, inter-comparability, ability to pay, and years?

In the restricted model a sixteen variable composite was tested for predictability in which the proxy variables defined as the cost of living wage criterion (2-5, 10, 11) were deleted from the full regression model. About 57 percent of the criterion variance was attributed to the sixteen variables representing the other wage criteria and years as shown in Table XXII. The difference between the total contribution value for the full model (.5911) and the total contribution value for the restricted model (.5676) yields an estimate of .0235 for the unique contribution of the cost of living wage criterion. The variance ratio test shows that this contribution is not significant at the .05 level.

Table XXII

Question: What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the cost of living wage criterion (Variables 2-5, 10, 11) in a regression model containing sixteen other variables (Variables 6-9, 12-23) representing the wage criteria of intra-comparability, inter-comparability, ability to pay, and years?

	RSQ	R	Unique contribution of var. 2-5, 10, 11	Sig. level
FM: 2-23	.5911	.7688[a]		
RM: 6-9, 12-23	.5676	.7534[a]	.0235	.7635

a: significant at the .01 level

What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the intra-comparability wage criterion (Variables 6-7) in a regression model containing twenty other variables (Variables 2-5, 8-23) representing the wage criteria of cost of living, inter-comparability, ability to pay, and years?

In the restricted model a twenty variable composite was tested for predictability in which the proxy variables defined as the intra-comparability wage criterion (6-7) were deleted from the full regression model. About 58 percent (.5817) of the criterion variance was attributed to the twenty variables representing the other wage criteria and years as shown in Table XXIII. The difference between the total contribution value for the full model (.5911) and the total contribution value for the restricted model (.5817) yields an estimate of .0094 for the unique contribution of the intra-comparability wage criterion. The variance ratio test shows that this contribution is not significant at the .05 level.

Table XXIII

Question: What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the intra-comparability wage criterion (Variables 6-7) in a regression model containing twenty other variables (Variables 2-5, 8-23) representing the wage criteria of cost of living, inter-comparability, ability to pay, and years?

	RSQ	R	Unique contribution of var. 6-7	Sig. level
FM: 2-23	.5911	.7688[a]		
RM: 205, 8-23	.5817	.7627[a]	.0094	.5175

a: significant at the .01 level

What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the inter-comparability wage criterion (Variables 2, 3, 8-11) in a regression model containing sixteen other variables (Variables 4-7, 12-23) representing the wage criteria of cost of living, intra-comparability, ability to pay, and years?

In the restricted model a sixteen variable composite was tested for predictability in which the proxy variables defined as the inter-comparability wage criterion (2, 3, 8-11) were deleted from the full regression model. About 56 percent (.5590) of the criterion variance was attributed to the twenty variables representing the other wage criteria and years as shown in Table XXIV. The difference between the total contribution value for the full model (.5911) and the total contribution value for the restricted model (.5590) yields an estimate of .0321 for the unique contribution of the inter-comparability wage criterion. The variance ratio test indicates that this contribution is not significant at the .05 level.

Table XXIV

Question: What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the inter-comparability wage criterion (Variables 2, 3, 8-11) in a regression model containing sixteen other variables (Variables 4-7, 12-23) representing the wage criteria of cost of living, intra-comparability, ability to pay, and years?

	RSQ	R	Unique contribution of var. 2, 3, 8-11	Sig. level
FM: 2-23	.5911	$.7688^a$		
RM: 4-7, 12-23	.5590	$.7477^a$	.0321	.6054
a: significant at the .01 level				

What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the ability to pay wage criterion (Variables 12-13) in a regression model containing twenty other variables (Variables 2-11, 14-23) representing the wage criteria of cost of living, intra-comparability, inter-comparability, and years?

In the restricted model a twenty variable composite was tested for predictability in which the proxy variables defined as the ability to pay wage criterion (12 and 13) were deleted from the full regression model. About 50 percent (.5008) of the criterion variance was attributed to the twenty variables representing the other wage criteria and years as shown in Table XXV. The difference between the total contribution value for the full model (.5911) and the total contribution for the restricted model (.5008) yields an estimate of .0903 for the unique contribution for the ability to pay wage criterion. The variance ratio test indicates that this contribution is significant at the level shown in Table XXV.

Table XXV

Question: What percent of variance in teacher withdrawal in the metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the ability to pay wage criterion (Variables 12-13) in a regression model containing twenty other variables (Variables 2-11, 14-23) representing the wage criteria of cost of living, intra-comparability, inter-comparability, and years?

	RSQ	R	Unique contribution of var. 10-13	Sig. level
FM: 2-23	.5911	.7688[a]	.0903	.0031
RM: 2-11, 14-23	.5008	.7076[a]		

a: significant at the .01 level

In the case of the group of non-metropolitan school districts a similar series of questions are posed.

What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the cost of living wage criterion (Variables 2-5, 10, 11) in a regression model containing sixteen other variables (Variables 6-9, 12-23) representing the wage criteria of intra-comparability, inter-comparability, ability to pay, and years?

In the restricted model a sixteen variable composite was tested for predictability in which the proxy variables defined as the cost of living wage criterion (2-5, 10, 11) were deleted from the full regression model. About 18 percent (.1752) of the criterion variance was attributed to the sixteen variables representing the other wage criteria and years as shown in Table XXVI. The difference between the total contribution value for the full model (.2262) and the total contribution value for the restricted model (.1752) yields an estimate of .0510 for the unique contribution of the cost of living wage criterion. The variance ratio test shows that this contribution is not significant at the .05 level.

Table XXVI

Question: What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the cost of living wage criterion (Variables 2-5, 10, 11) in a regression model containing sixteen other variables (Variables 6-9, 12-23) representing the wage criteria of intra-comparability, inter-comparability, abiliy to pay, and years?

	RSQ	R	Unique contribution of var. 2-5, 10, 11	Sig. level
FM: 2-23	.2262	.4756^b	.0510	.1778
RM: 6-9, 12-23	.1752	.4186^b		
b: significant at the .05 level				

What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the intra-comparability wage criterion (Variables 6-7) in a regression model containing twenty other variables (Variables 2-5, 8-23) representing the wage criteria of cost of living, inter-comparability, ability to pay, and years?

In the restricted model a twenty variable composite was tested for predictability in which the proxy variables defined as the intra-comparability wage criterion (Variables 6-7) were deleted from the full regression model. About 23 percent (.2253) of the criterion variance was attributed to the twenty variables representing the other wage criteria and years as shown in Table XXVII. The difference between the total contribution value for the full model (.2262) and the total contribution value for the restricted model (.2253) yields an estimate of .0009 for the unique contribution of the intra-comparability wage criterion. The variance ratio test shows that this contribution is not significant at the .05 level.

Table XXVII

Question: What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the intra-comparability wage criterion (Variables 6-7) in a regression model containing twenty other variables (Variables 2-5, 8-23) representing the wage criteria of cost of living, inter-comparability, ability to pay, and years?

	RSQ	R	Unique contribution of var. 6-7	Sig. level
FM: 2-23	.2262	.4756[b]		
RM: 2-5, 8-23	.2253	.4747[a]	.0009	.9265

a: significant at the .01 level
b: significant at the .05 level

What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the inter-comparability wage criterion (Variables 2, 3, 8-11) in a regression model containing sixteen other variables (Variables 4-7, 12-23) representing the wage criteria of cost of living, intra-comparability, ability to pay and years?

In the restricted model a sixteen variable composite was tested for predictability in which the proxy variables defined as the inter-comparability wage criterion (Variables 2, 3, 8-11) were deleted from the full regression model. About 11 percent (.1144) of the criterion variance was attributed to the sixteen variables representing the other wage criteria and years as shown in Table XXVIII. The difference between the total contribution value for the full model (.2262) and the total contribution for the restricted model (.1144) yields an estimate of .1118 for the unique contribution of the inter-comparability wage criterion. The variance ratio test shows that this contribution is significant at the level shown in Table XXVIII.

Table XXVIII

Question: What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the inter-comparability wage criterion (Variables 2, 3, 8-11) in a regression model containing sixteen other variables (Variables 4-7, 12-23) representing the wage criteria of cost of living, intra-comparability, ability to pay, and years?

	RSQ	R	Unique contribution of var. 2, 3, 8-11	Sig. level
FM: 2-23	.2262	$.4756^b$		
RM: 4-7, 12-23	.1144	.3382	.1118	.0044
b: significant at the .05 level				

What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the ability to pay wage criterion (Variables 12-13) in a regression model containing twenty other variables (Variables 2-11, 14-23) representing the wage criteria of cost of living, intra-comparability, inter-comparability, and years?

In the restricted model a twenty variable composite was tested for predictability in which the proxy variables defined as the ability to pay wage criterion (Variables 12-13) were deleted from the full regression model. About 22 percent (.2204) of the criterion variance was attributed to the twenty variables representing the other wage criteria and years as shown in Table XXIX. The difference between the total contribution value for the full model (.2262) and the total contribution value for the restricted model (.2204) yields an estimate of .0058 for the unique contribution of the ability to pay wage criterion. The variance ratio test indicates that this contribution is not significant at the .05 level.

Table XXIX

Question: What percent of variance in teacher withdrawal in the non-metropolitan school districts of the State of Maryland (Variable 1) is uniquely accounted for by the ability to pay wage criterion (Variables 12-13) in a regression model containing twenty other variables (Variables 2-11, 14-23) representing the wage criteria of cost of living, intra-comparability, inter-comparability, and years?

	RSQ	R	Unique contribution of var. 12-13	Sig. level
FM: 2-23	.2262	.4756^b		
RM: 2-11, 14-23	.2204	.4694^b	.0058	.5974
b: significant at the .05 level				

SUMMARY OF FINDINGS

In summary the findings, in terms of the unique contribution proportion each of the combination of independent variables makes toward the prediction of teacher withdrawal, are given in Table XXX along with the significance level of each contribution. Conclusions surrounding the findings are discussed in Chapter V.

Table XXX

Summary table of the unique contribution proportion each of the combination of independent variables makes toward the prediction of teacher withdrawal

Variables	Unique contribution	Significance level
I. The relationship between economic concerns and teacher withdrawal in the State of Maryland		
Economic concerns (2-13)	.1654	< .00005
Years (14-23)	.0310	.3704
II. The contribution each of the wage criteria make to the prediction of teacher withdrawal in the State of Maryland		
Cost of living (2-5, 10, 11)	.0349	.0808
Intra-comparability (6, 7)	.0016	.7661
Inter-comparability (2, 3, 8-11)	.0912	.0001
Ability to pay (12-13)	.0122	.1365
III. The relationship between economic concerns and teacher withdrawal for type of district		
Type of district (24-25)	.0087	.1725
Metropolitan districts		
Economic concerns (2-13)	.5228	< .00005
Non-metropolitan districts		
Economic concerns (2-13)	.1668	.0057
IV. The contribution each of the wage criteria make to the prediction of teacher withdrawal for type of district		
Metropolitan districts		
Cost of living (2-5, 10, 11)	.0235	.7635
Intra-comparability 6, 7)	.0094	.5175
Inter-comparability (2, 3, 8-11)	.0321	.6054
Ability to pay (12-13)	.0903	.0031
Non-metropolitan districts		
Cost of living (2-5, 10, 11)	.0510	.1778
Intra-comparability (6, 7)	.0009	.9265
Inter-comparability (2, 3, 8-11)	.1118	.0044
Ability to pay (12-13)	.0058	.5974

CHAPTER V

CONCLUSIONS, SUMMARY, AND RECOMMENDATIONS

CONCLUSIONS

The conclusions developed from the findings of this study will be discussed under the same four section headings used to describe the findings in Chapter IV.

Section I

The degree of relationship existent between economic concerns and teacher withdrawal for the school districts of the State of Maryland

A major conclusion developed as a result of this investigation was that the economic variables included exhibited a measurable degree of relationship with the withdrawal of teachers in the State of Maryland during the period of 1960 to 1970. The force of this conclusion has to be modified, however, due to the modest contribution of the economic variables to the prediction of teacher withdrawal. Furthermore, examination of the relative importance of the 24 independent variables in the multiple regression analysis, through the entry levels given in Table VIII, shows that the type of district (Variable 25), a non-economic variable, was the best single predictor of teacher withdrawal. The economic proxy variable, average salary, year t (Variable 3), yields the greatest increase in RSQ when combined with the type of district variable at the second step of the regression analysis despite the fact that the proxy variable representing the salary score for the district under investigation (Variable 6) has the second highest correlation with the criterion variable. Evidently much of what is measured by the variable representing the salary score for the district under investigation (Variable 6) has already been accounted for by the proxy variable average salary, year t (Variable 3). The best of the predictor variables are the type of district, average salary, year t , and the weighted index of average earnings, year t - 1 . All other economic proxy variables entered into the regression analysis at a point which added little to the size of the RSQ. This moderate relationship would appear to be supported by those like Stinnett[1] who was earlier reported as indicating that other factors are as important to persistence in a teaching position as the obvious factor of economic considerations.

The findings of this study support the conclusion that a relationship does exist between wage criteria and teacher withdrawal, however, the relationship does not appear to be as precise as traditional labor allocation theory hypothesizes.[2] Supportive of this conclusion was the statement by Parnes[3] given earlier, in the review of the literature, concerning the relatively indirect relationship between wages and mobility. In addition, the conclusions developed by Harris[4] and Hall,[5] from their investigations of why teachers withdraw, appear to reinforce the general conclusion of this study that movement among positions in the teaching profession is a manifestation of many forces, only one of which may be economic in nature.

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[1] See Chapter II, p. 23.

[2] See Chapter II, Parnes, p. 21.

[3] See Chapter II, p. 22.

[4] See Chapter II, p. 29.

[5] See Chapter II, p. 30.

It is significant that a relationship between economic factors and teacher withdrawal was found during the ten year period of 1960 to 1970. Though the last two years of this past decade have signaled an end to the general teacher shortage,[6] the major portion of this period can generally be regarded as a time in which teacher demand generally outweighed teacher supply. Parnes[7] indicated that if the relationship theorized by the traditional labor allocation economist was to function, it would operate most strongly when employment opportunities were abundant. The past ten year period offered an opportune time to test the adequacy of the traditional labor allocation theory in the teaching profession. The significant, but small relationship exhibited during this time period supports the conclusion that economic forces are not the singular compelling factor in the decisions of teachers to withdraw from a position.

Section II

The contribution each of the four wage criteria make to the prediction of teacher withdrawal in the school districts of the State of Maryland

This study only sought to discover associative relationships between the selected economic factors and teacher withdrawal. Since it is recognized that other independent variables may bear a relationship to teacher withdrawal, the results of this study are limited to appropriate conclusions concerning only the definitions of the variables identified through this study. Though the literature indicated that the four wage criteria of cost of living, intra-comparability of wages, inter-comparability of wages, and ability to pay were associated with salary determination, the findings of this study indicate that all four wage criteria are not similarly associated with teacher withdrawal.

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[6] "End of General Teacher Shortage", NEA Research Bulletin, XLIX (March, 1971), 9-10.

[7] See Chapter II, p. 22.

The wage criterion of inter-comparability was the only significant predictor of teacher withdrawal (i.e., beyond the .05 level of significance) for all teachers in the state of Maryland during the period 1960 to 1970; the intra-comparability wage criterion did not contribute to the prediction of teacher withdrawal. An examination of the relative importance of each of the 24 independent variables in the multiple regression analysis, through the entry levels given in Table VIII, shows the reason for this conclusion. In the case of the economic proxy variables defined under the inter-comparability wage criterion average salary, year t (in the case of the inter-comparability wage criterion, variable 11 is the same as variable 3, average salary, year t) and the proxy variable weighted index of average earnings, year $t-1$ (Variable 8) entered the regression analysis at an early level. This early entry into the analysis resulted in a significant increase in the RSQ level. By contrast, both of the proxy variables included in the operational definition of the intra-comparability wage criterion (Variable 6--salary score for district under investigation, and Variable 7--salary score for competitor district) entered the regression analysis late which attests to the reason why the intra-comparability wage criterion did not contribute significantly to the prediction of teacher withdrawal.

It was pointed out in the review of the literature that Gerwin[8] stressed, in his model of salary determination, that a motivating force behind an increase in salary is employee dissatisfaction as measured by inter-occupational salary comparisons. Furthermore, Gerwin felt that in any given public organization, intra-occupational comparisons tend not to lead to dissatisfaction due to the existence of salary schedules. Gerwin's general conclusions concerning the relationship between the comparability wage criterion and teacher salary determination appear to equally reinforce the conclusion of this study that teachers, though possibly cognizant of differences in the salary scales of teachers in neighboring districts, show more relationship in their withdrawal decisions to wage differences in occupations outside education.

Christenson[9] and Lund,[10] in their studies reported earlier, found that the cost of living was the most efficient predictor of teacher salary scales. Though the significance level of the variance ratio test for the relationship between the cost of living wage criterion and teacher withdrawal (.0808) tends to indicate a possibility of some association, it should be noted that the greatest part of the contribution this criterion makes to the prediction of teacher withdrawal was made by the proxy variable average salary, year t (Variable 3) as shown in Table VIII. The cost of living index as represented by the proxies, Consumer Price Index, year t - 1 and year t (Variables 4 and 5), entered the regression analysis so late that little could have been added to the prediction of teacher withdrawal from these variables. The cost of living index, therefore, appeared to bear little relationship to the withdrawal decisions of Maryland teachers in general.

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[8] See Chapter II, p. 17.

[9] See Chapter II, p. 17.

[10] See Chapter II, p. 17.

The ability to pay wage criterion, though also emphasized by Gerwin[11] as a determinant of salaries did not prove of significance in predicting teacher withdrawal. An examination of Table VIII shows, however, that the economic proxy variable true valuation per pupil belonging (Variable 13) entered the regression analysis fairly early. This factor, in conjunction with the relatively low intercorrelation with the other economic proxy variables, serves to indicate that this proxy variable is possibly measuring something bearing a relationship to teacher withdrawal which is not being accounted for by the other economic proxy variables.

Finally, in interpreting this last wage criterion it should be remembered that this definition of ability to pay relied on property assessment as a measure of potential. Should another measure (e.g., per capita income) been used the relationship could have exhibited different results. This situation serves to illustrate the point made at the outset of this section concerning the restrictions to interpretation imposed by the definitions of the wage criteria used.

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[11] See Chapter II, p. 17.

Section III

The degree of relationship existent between economic concerns and teacher withdrawal a) for metropolitan districts, and b) for non-metropolitan districts in the State of Maryland

Several investigators cited in the review of the literature[12] found that size or growth in size of staff of a district was associated with turnover in the district. In this study, the nature of the district (i.e., whether the district was considered metropolitan or non-metropolitan due to its SMSA classification) did not appear to be related to whether or not economic factors were associated with teacher withdrawal. More precisely, the economic criteria included in this investigation exhibited a measurable degree of relationship with the withdrawal of teachers in both the metropolitan and non-metropolitan school districts of the State of Maryland during the ten year period, 1960 to 1970. Evidently both metropolitan and non-metropolitan teachers could be said to be aware of certain economic factors when making withdrawal decisions.

This relationship cannot be interpreted completely, however, without noting the difference in the degree of relationship between both groups of districts. Considerably more variance in teacher withdrawal was explained by the economic variables for the metropolitan districts than for the non-metropolitan districts. This finding, therefore, refines the initial conclusion concerning no difference in the effect of economic considerations for the two groups of districts. Though teacher withdrawal in both groups of districts exhibited a significant relationship with economic concerns, the difference in the degree of relationship would appear to indicate that the metropolitan teacher gave more weight to economic concerns than his or her non-metropolitan counterpart when making a withdrawal decision.

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[12] See Chapter II: Elsbree, p. 24; White, p. 24; Forrest, p. 25; Lindenfield, p. 24.

This conclusion, however, has to be tempered further due to the small number (N) of cases in the study. Guilford[13] discusses the interpretation of multiple R's in small samples (i.e., any sample with N less than 100) by stating that values obtained from samples this small are inflated due to chance deviations that favor high multiple correlations. By applying a formula which Guilford suggests[14] a correction for this bias in the case of the group of metropolitan districts (N = 8 districts × 10 years = 80) can be made. A corrected RSQ value of .4464 is obtained by applying this formula to the group of metropolitan districts. The relationship between economic factors and teacher withdrawal remains approximately two and one half times stronger for metropolitan teachers than for non-metropolitan teachers.

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[13] J.P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Company, 1965), pp. 400-401.

[14] Ibid., p. 401.

Section IV

The contribution each of the four wage criteria make to the prediction of teacher withdrawal a) for metropolitan districts, and b) for non-metropolitan districts in the State of Maryland

Though a measurable degree of relationship was exhibited between economic concerns and teacher withdrawal for both metropolitan and non-metropolitan districts, a regression analysis showing the unique contribution each of the wage criterion made to the prediction of teacher withdrawal in each group of districts reveals a number of differences.

In neither the metropolitan nor non-metropolitan districts did the cost of living wage criterion make a significant contribution to the prediction of teacher withdrawal. However, the difference in the significance of the variance ratio generated for each analysis initially shows that the cost of living wage criterion appeared more closely associated with teacher withdrawal in the non-metropolitan districts. Closer examination of the analysis of this wage criterion in both groups of districts through Tables XVII and XX reveals that in both groups of districts the economic proxy variables Consumer Price Index, year $t-1$ and year t (Variables 4 and 5) entered the regression analysis late, if at all. Only in the case of the economic proxy variable average salary, year t (Variable 3) for the non-metropolitan group of districts did a proxy variable defined under the cost of living wage criterion enter the analysis at a point which could significantly raise the RSQ level. In neither group of districts did the Consumer Price Index, *per se*, appear to be related to the withdrawal of teachers.

In the case of the intra-comparability wage criterion both groups of districts showed little relationship to this criterion in terms of the withdrawal of teachers. Although the literature indicated that this wage criterion was recognized as being instrumental in developing salary scales, the results of this study show that the comparison of teacher salary scales and their structure did not contribute significantly to the prediction of teacher withdrawal. Examination of the analysis of this wage criterion for both groups of districts through Tables XVII and XX shows the economic proxy variables representing this wage criterion (Variable 6--salary score for district under investigation, and Variable 7--salary score for competitor district) enter the regression analysis at a point which added little to the prediction of teacher withdrawal. From the results of this investigation teachers in both metropolitan and non-metropolitan districts choose to base changes in position on factors other than teacher salary scale comparison.

The inter-comparability wage criterion, however, produced an interesting contrast in terms of results. Metropolitan district teacher withdrawal, again, did not exhibit a measurable degree of relationship with this wage criterion; non-metropolitan district teacher withdrawal was most significantly predicted by this wage criterion. In comparing the entry levels of the economic proxy variables shown in Tables XVII and XX for this wage criterion it can be seen that both groups of districts have one of the weighted index of average earnings variables (economic proxy variable 8 or 9) entered into the regression analysis at either the first or second level of entry. The difference in the significance of the relationship for the two groups of districts can be attributed to the greater importance of the average salary proxy variables (economic proxy variable 2-10 and 3-11) for the non-metropolitan districts. The teacher from the non-metropolitan district relates his average salary more closely to average earnings outside education when considering withdrawal decisions than a metropolitan teacher. A possible reason for this difference in relationship may be attributed to the fact that teachers are close to the only professionals working in the non-metropolitan areas. The realities of the non-metropolitan socio-economic environment possibly force the non-metropolitan teacher into making such a comparison.

Lastly, the ability to pay wage criterion provided a similar contrast, but in a converse direction to that shown for the inter-comparability criterion. Here the ability to pay criterion showed little relationship to teacher withdrawal in non-metropolitan districts, but was the most significant predictor of teacher withdrawal in the metropolitan districts. A comparison of the entry levels of the economic proxy variables defined under the ability to pay wage criterion, through Tables XVII and XX, shows the greater importance of these variables for the metropolitan districts. Teachers in the metropolitan districts related their withdrawal decisions more closely to the economic proxy variables local revenue raised per pupil belonging and true valuation per pupil belonging (Variables 12 and 13) than any other variable save one. This relatively strong relationship can be interpreted to mean that the greater effort a metropolitan district makes relative to its economic potential, the less tendency for teachers to withdraw. The major significance of this conclusion, however, may be that this same conclusion does not appear to hold for the non-metropolitan district.

SUMMARY

The primary purpose of this study was to measure the relationship between a set of economic concerns and teacher withdrawal in the State of Maryland for the period 1960 to 1970. A secondary purpose was to compare this relationship for the metropolitan and non-metropolitan districts in the state.

The variables chosen to represent economic concerns were the following wage criteria: cost of living, intra-comparability of wages, inter-comparability of wages, and ability to pay. Since a review of the literature seemed to show that teachers consider wage criteria in determining salary, the rationale of this study assumed these same teachers considered wage criteria in withdrawal decisions. The framework for the analysis of the problem, therefore, connected the four wage criteria or independent variables with the criterion variable of teacher withdrawal in both the metropolitan and non-metropolitan school districts of the state of Maryland.

Multiple linear regression served as the statistical tool from which the analysis of the data emanated. By comparing the contribution to the prediction of the criterion variable of a restricted model with that of the contribution to prediction of a full model a difference between the full model and restricted model contribution was obtained. These differences between the full model and each restricted model were tested for statistical significance with the variance ratio test.

The following results are based on the analysis of the data:

1) Economic factors, as represented by the wage criteria, added significantly to the prediction of teacher withdrawal in the State of Maryland for the period of 1960 to 1970. The proportion of contribution although low was significant.
2) Of the wage criteria defined, inter-comparability of wages made the largest and only significant contribution to the prediction of teacher withdrawal in the state of Maryland during this period.
3) Prediction of teacher withdrawal was not found to be affected by whether a school district was metropolitan or non-metropolitan. However, a separate analysis of the relationship for metropolitan and non-metropolitan districts did show some difference. In the metropolitan districts of the state of Maryland the proportion of contribution economic factors made to the prediction of teacher withdrawal was approximately 52 percent (45 percent adjusted for a small N). For the non-metropolitan districts the proportion of contribution economic factors made to the prediction of teacher withdrawal was approximately 17 percent.
4) Of the wage criteria defined, ability to pay made the only significant contribution to the prediction of teacher withdrawal in the metropolitan districts of the State of

Maryland. In the case of the non-metropolitan districts, the inter-comparability wage criterion made the only significant contribution to the prediction of teacher withdrawal.

RECOMMENDATIONS

The recommendations presented are based on the investigation as a whole and are not necessarily derived solely from the results of the study. As a result, the recommendations fall into the following three categories.

A. Recommendations concerning the results of the study:

It is recommended that educational decision-makers consider the results of this investigation when determining salaries. The conclusions developed from this study would seem to indicate that any statement indicating that economic concerns are the prime cause for teacher withdrawal is both an overemphasis and an oversimplification.

B. Recommendations concerning the limitations of the study:

1) The literature pointed to a difference between the forces which motivate male and female teachers to leave their positions, however, the data available for this study precluded this approach. A replication of this study in terms of partitioning the criterion variable into male and female teacher withdrawal appears appropriate.

2) By definition, the operational descriptions of the wage criteria were restrictive. Other definitions of the wage

criteria, or another framework for analysis, could verify or negate the results of this study.

C. Recommendations for the future:

1) Use of the economic criteria included in this study in conjunction with other variables identified through the literature as being critical to teacher withdrawal could result in a model which not only better captures the complexities of teacher withdrawal, but improves the ability to predict teacher withdrawal.

2) The next ten year period (1970 to 1980), if present projections hold true, will provide a different supply/demand situation relative to the past ten years in the teaching profession. A replication of this study at the end of the next ten year period would produce a comparison which could further refine the initial findings of this study.

APPENDIXES

Appendix I

Number of withdrawals due to economic reasons by local unit

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	6	11	10	6	12	20	15	4	18	12
Anne Arundel	40	28	121	135	139	153	178	164	149	128
Baltimore City	121	60	85	100	98	180	214	142	131	161
Baltimore	54	90	89	123	154	70	105	102	103	76
Calvert	12	15	25	21	30	18	13	22	10	2
Caroline	13	8	9	24	9	24	18	14	23	27
Carroll	28	16	27	14	12	25	30	31	29	32
Cecil	26	18	30	24	33	35	33	24	37	36
Charles	10	11	18	13	22	42	44	76	33	30
Dorchester	6	10	11	15	7	16	22	13	15	33
Frederick	28	17	29	56	24	12	36	17	14	29
Garrett	12	9	17	10	0	14	24	8	7	15
Harford	32	35	58	35	41	39	54	47	46	46
Howard	19	11	20	18	19	24	27	39	32	25
Kent	5	10	9	5	9	8	11	18	13	29
Montgomery	51	64	80	84	93	142	113	90	102	76
Prince George	100	83	77	124	93	96	135	132	114	124
Queen Anne	8	10	11	16	11	28	12	2	13	11
St. Mary	14	15	10	6	13	25	21	26	11	21
Somerset	13	7	6	3	8	12	13	9	8	12
Talbot	10	10	16	13	9	21	20	29	12	18
Washington	9	20	15	20	22	25	10	28	17	21
Wicomico	13	21	26	33	19	38	44	32	23	42
Worcester	14	12	16	22	17	9	17	28	24	26

Source: Annual Report of the State Board of Education of the State of Maryland and Maryland State Department of Education releases.

Appendix II

Number of staff by local unit

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	641	651	687	679	692	747	763	743	766	793
Anne Arundel	1704	1846	1990	2160	2434	2612	2839	2919	3036	3402
Baltimore City	6533	6365	6834	7361	7633	8164	8293	8026	8363	8773
Baotimore	3694	3910	4452	4716	4955	5229	5568	5775	6119	6307
Calvert	175	187	200	209	222	227	259	242	244	250
Caroline	197	202	212	222	227	247	254	245	252	248
Carroll	451	463	493	510	545	582	652	694	720	724
Cecil	394	401	419	429	450	488	511	519	583	537
Charles	298	313	342	386	397	442	476	502	559	578
Dorchester	238	242	254	266	272	301	312	281	291	291
Frederick	629	667	711	728	756	776	806	873	902	922
Garrett	188	189	194	195	198	227	233	222	238	253
Harford	676	713	746	806	881	1014	1148	1188	1330	1357
Howard	318	354	379	420	469	480	553	608	698	770
Kent	148	152	157	162	171	184	186	179	185	195
Montgomery	3349	3916	4068	4288	4713	5062	5404	5571	5941	6562
Prince George	2832	3122	3617	4080	4587	5215	5907	6378	7141	7717
Queen Anne	166	172	178	180	187	195	223	230	234	226
St. Mary	246	258	277	307	335	445	400	414	444	474
Somerset	181	187	193	194	197	200	201	197	199	211
Talbot	174	182	184	183	192	207	207	216	233	240
Washington	760	774	843	840	918	958	997	1011	1026	1048
Wicomico	404	423	453	475	511	559	570	581	647	672
Worcester	239	244	244	246	258	264	270	317	315	324

Source: Annual Report of the State Board of Education of the State of Maryland and Maryland State Department of Education releases.

Appendix III

Proxy Variables

Appendix III

TABLE A

Withdrawal rate by local unit

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	.0093	.0168	.0145	.0088	.0173	.0267	.0196	.0053	.0234	.0151
Anne Arundel	.0234	.0151	.0608	.0625	.0571	.0585	.0626	.0561	.0490	.0376
Baltimore City	.0185	.0094	.0124	.0135	.0128	.0220	.0258	.0176	.0156	.0184
Baltimore	.0146	.0230	.0199	.0260	.0310	.0133	.0188	.0177	.0168	.0121
Calvert	.0685	.0802	.1250	.1004	.1351	.0792	.0501	.0909	.0409	.0080
Caroline	.0659	.0396	.0424	.1081	.0396	.0971	.0708	.0571	.0912	.1089
Carroll	.0620	.0345	.0547	.0274	.0220	.0429	.0460	.0446	.0402	.0442
Cecil	.0659	.0448	.0715	.0559	.0733	.0717	.0645	.0462	.0634	.0670
Charles	.0335	.0351	.0526	.0336	.0554	.0950	.0924	.1513	.0590	.0519
Dorchester	.0252	.0413	.0433	.0563	.0257	.0531	.0705	.0462	.0515	.1134
Frederick	.0445	.0254	.0407	.0769	.0317	.0154	.0446	.0194	.0155	.0315
Garrett	.0638	.0476	.0876	.0512	.0000	.0616	.1030	.0360	.0294	.0593
Harford	.0473	.0490	.0777	.0434	.0465	.0384	.0470	.0395	.0345	.0339
Howard	.0597	.0310	.0527	.0428	.0405	.0500	.0488	.0641	.0458	.0325
Kent	.0337	.0657	.0573	.0308	.0526	.0434	.0591	.1005	.0702	.1487
Montgomery	.0152	.0163	.0196	.0195	.0197	.0280	.0209	.0161	.0171	.0116
Prince George	.0353	.0265	.0212	.0303	.0202	.0184	.0228	.0216	.0158	.0161
Queen Anne	.0481	.0581	.0617	.0888	.0588	.1435	.0538	.0086	.0555	.0487
St. Mary	.0569	.0581	.0361	.0195	.0388	.0561	.0525	.0628	.0247	.0443
Somerset	.0718	.0374	.0310	.0154	.0406	.0600	.0646	.0456	.0402	.0569
Talbot	.0574	.0549	.0869	.0710	.0468	.1014	.0881	.1342	.0515	.0750
Washington	.0118	.0258	.0177	.0238	.0239	.0260	.0100	.0276	.0165	.0200
Wicomico	.0321	.0496	.0573	.0694	.0371	.0679	.0771	.0550	.0355	.0625
Worcester	.0585	.0491	.0655	.0894	.0658	.0340	.0629	.0883	.0761	.0802

Appendix III

TABLE B

Average salary for teachers by local unit

School District	59-60	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	5079	5403	5707	5661	6283	6538	6568	6828	7779	8635	8949
Anne Arundel	4666	4937	5220	5448	5607	5676	6227	6778	7155	7851	9011
Baltimore City	5450	5999	6488	6249	6193	6515	6690	7560	8059	8801	9032
Baltimore	5447	5802	5910	5964	6319	6527	6829	7332	8072	8570	9324
Calvert	4519	4649	5029	5428	5540	6135	6198	6517	6556	7994	8248
Caroline	4795	5097	5365	5299	5404	6110	6087	6354	6935	7579	7337
Carroll	4805	5091	5373	5737	5865	6395	6340	6604	7411	7321	8054
Cecil	4898	5244	5638	5868	6089	6514	6361	7162	7607	7730	8763
Charles	5125	5434	5744	5658	5622	6469	6519	6383	7682	7811	8290
Dorchester	4813	5139	5343	5489	5651	6318	6271	6504	7603	8065	8299
Frederick	5109	5274	5685	5666	6017	6978	7043	7207	7085	7553	8810
Garrett	4956	5188	5445	5461	5529	6439	6355	6534	6736	7576	7932
Harford	5011	5501	5740	5843	6117	6331	6490	6569	7488	8115	8440
Howard	5031	5374	5524	5770	6007	6303	6721	7020	7763	8585	8945
Kent	4722	4978	5253	5482	5610	6334	6230	6412	6445	6851	7487
Montgomery	6439	6469	6439	7304	7230	7448	8051	8386	9185	10134	11189
Prince George	5264	5626	5858	5964	6127	6447	6888	7272	8017	8562	10502
Queen Anne	4831	5166	5359	5451	5710	6283	6385	6567	6699	6861	7754
St. Mary	4469	4575	4952	4945	5103	5651	5402	6000	6469	7485	7573
Somerset	4711	4910	5169	5213	5356	6195	6209	6456	7277	7774	7762
Talbot	4835	5065	5252	5307	5838	6390	6208	6654	7559	7629	8484
Washington	5265	5581	5777	5945	6222	7001	7103	7030	8315	8749	9288
Wicomico	4763	5100	5332	5535	5466	6048	6322	6610	7432	8142	8229
Worcester	4588	5071	5201	5182	5252	6124	6172	6787	7011	7166	8039

Source: Annual Report of the State Board of Education of the State of Maryland and Maryland State Department of Education releases.

Appendix III

TABLE C

Consumer Price Indexes for U.S. City Average, Baltimore, Maryland and Washington, D.C.*

	U.S. City Average	Baltimore, Maryland	Washington, D.C.
1959-60	1.027	1.030	1.019
1960-61	1.041	1.045	1.039
1961-62	1.055	1.048	1.046
1962-63	1.071	1.068	1.068
1963-64	1.082	1.080	1.087
1964-65	1.100	1.110	1.096
1965-66	1.141	1.143	1.140
1966-67	1.169	1.157	1.173
1967-68	1.219	1.206	1.231
1968-69	1.287	1.279	1.308
1969-70	1.360	1.352	1.378

1957-59 = 1.000

*Index values adjusted to run concurrent with school year.

Source: Handbook of Labor Statistics, 1970, Washington, D.C. U.S. Department of Labor (BLS), 1970.

Appendix III

TABLE D

Salary schedule scores for teachers by local unit

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	234	222	185	177	170	228	228	367	445	468
Anne Arundel	147	80	119	147	181	345	401	409	496	513
Baltimore City	153	162	161	228	250	261	331	325	398	351
Baltimore	223	191	183	205	228	358	401	476	555	665
Calvert	84	106	160	155	218	223	292	274	346	379
Caroline	109	153	153	192	155	185	190	204	312	348
Carroll	138	170	199	199	150	255	242	320	368	402
Cecil	135	140	190	158	250	250	312	329	402	352
Charles	75	114	87	188	242	275	250	322	378	354
Dorchester	81	110	110	113	120	149	124	291	375	406
Frederick	138	153	253	236	207	277	283	291	374	441
Garrett	153	144	120	120	120	150	155	254	256	265
Harford	182	186	202	189	281	227	330	386	485	560
Howard	141	184	219	220	293	374	304	332	403	502
Kent	90	141	108	121	155	155	156	219	238	238
Montgomery	373	373	387	387	450	435	467	599	628	665
Prince George	106	198	213	239	330	357	413	551	681	710
Queen Anne	95	78	88	124	148	148	138	264	354	482
St. Mary	33	96	97	141	137	202	229	365	381	421
Somerset	105	75	80	70	53	53	98	294	306	351
Talbot	136	134	135	142	158	158	129	326	301	370
Washington	76	81	93	124	205	286	285	327	350	344
Wicomico	76	155	126	126	160	134	165	189	367	359
Worcester	144	121	121	121	150	150	159	179	202	314
A.I. Dupont, Del.	234	211	222	245	323	363	410	428	495	525
Newark, Del.	-	-	-	196	266	245	376	411	411	400
Washington, D.C.	214	214	290	290	223	254	286	286	411	345
Franklin Cty , Pa.	153	163	-	225	-	-	300	313	308	270

Appendix III (Cont.)

Table D

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Somerset Cty., Pa.	-	-	-	188	150	-	-	-	-	-
Arlington Cty., Va.	161	189	249	339	407	403	419	416	573	630
Fairfax Cty., Va.	-	145	105	312	279	316	340	513	593	650
Faquier Cty., Va.	-	-	-	62	62	-	-	136	177	150
Loudon Cty., Va.	-	-	-	-	-	55	109	-	139	175
Berkeley Cty., W. Va.	65	-	72	94	94	104	120	121	180	135
Jefferson Cty., W. Va.	-	-	-	81	81	-	-	-	-	-
Mineral Cty., W.Va.	-	-	-	80	-	-	-	-	-	-
Preston Cty., W. Va.	-	-	-	98	106	109	124	198	191	135

Source:Maryland State Teachers Association (state of Maryland salary data).
National Education Association (out of state salary data).

Appendix III

TABLE E

Weighted index figures for areas used in deriving the inter-comparability variable

Year	Area					
	1	2	3	4	5	6
1959-60	100.0	100.0	100.0	100.0	100.0	100.0
1960-61	103.9	102.0	103.8	103.2	103.0	102.4
1961-62	106.1	104.8	107.7	106.1	106.8	104.8
1962-63	109.8	107.4	110.7	109.6	110.5	108.2
1963-64	113.6	109.8	113.8	112.6	114.1	110.7
1964-65	117.0	111.7	117.4	116.2	118.5	113.7
1965-66	121.2	114.3	119.2	121.1	121.9	117.2
1966-67	127.7	116.4	124.1	126.4	127.4	124.0
1967-68	136.9	120.4	131.5	132.7	134.8	131.1
1968-69	143.9	125.6	138.6	141.5	144.8	139.0
1969-70	151.4	131.8	146.1	150.2	156.3	147.2

Area 1: Baltimore, Maryland

Area 2: Charleston, West Virginia

Area 3: Norfolk, Virginia

Area 4: Philadelphia, Pennsylvania

Area 5: Washington, D.C.

Area 6: York, Pennsylvania

Source: Area Wage Surveys, Washington, D.C.: Department of Labor (BLS)

Appendix III

TABLE F

Revenue raised locally for current expenses per pupil belonging

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	133	140	150	183	181	226	239	299	374	392
Anne Arundel	141	149	167	179	166	223	247	286	348	395
Baltimore City	280	285	300	299	293	327	396	343	417	425
Baltimore	298	303	320	346	351	398	424	457	533	594
Calvert	75	80	122	138	133	161	205	208	270	327
Caroline	122	120	129	146	148	157	185	203	237	260
Carroll	162	164	190	200	193	231	284	311	364	397
Cecil	137	150	159	177	190	207	251	257	317	360
Charles	93	86	124	149	140	167	222	289	340	363
Dorchester	144	144	158	161	176	179	196	242	284	348
Frederick	202	224	226	247	239	260	306	351	436	483
Garrett	78	81	94	89	107	115	126	150	213	232
Harford	148	155	152	178	169	193	222	238	297	353
Howard	166	184	209	230	271	334	385	389	432	513
Kent	148	164	186	227	212	276	317	367	419	467
Montgomery	321	383	390	393	422	440	508	499	603	717
Prince George	175	172	217	236	261	314	371	368	498	556
Queen Anne	167	170	178	206	201	214	267	303	316	367
St. Mary	79	104	83	103	81	110	132	166	188	193
Somerset	72	76	87	95	99	106	130	141	183	206
Talbot	157	168	190	206	235	270	309	394	434	512
Washington	206	205	231	242	240	259	278	315	375	430
Wicomico	137	146	172	175	187	205	222	267	315	312
Worcester	179	196	194	202	209	220	280	312	360	414

Source: *Annual Report of the State Board of Education of the State of Maryland* and Maryland State Department of Education releases.

Appendix III

TABLE G

True valuation per pupil belonging

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	23757	24278	22384	23574	24870	25988	27261	30154	30855	31784
Anne Arundel	21839	22381	20926	21478	22515	23673	25659	27083	28554	29429
Baltimore City	29304	27400	27694	27207	27598	27539	28789	27967	28238	28078
Baltimore	33828	34344	35421	35031	34636	35599	36706	37765	37524	37295
Calvert	15825	16325	14424	14921	16203	17184	19816	22496	24142	27750
Caroline	16581	16635	17078	17535	17500	18030	19720	19594	19941	20375
Carroll	24953	25707	26099	26035	27951	29688	30760	32338	33510	34973
Cecil	25240	25314	20681	21145	22063	22907	24909	25076	25609	26948
Charles	16606	17751	16928	18081	19423	21656	24117	26407	26980	27813
Dorchester	22918	23444	22979	22609	23534	24372	25783	27141	29757	31629
Frederick	32303	33968	29204	30240	31925	34161	34201	35499	36108	37726
Garrett	17829	18766	17453	17907	18404	19591	24245	30316	31962	31896
Harford	26264	26788	22762	23001	23699	25571	27234	27963	28022	29072
Howard	25232	26992	29707	30456	32504	33771	35622	35503	37742	40018
Kent	28287	29751	28305	30770	31809	32974	35034	36481	40964	39302
Montgomery	32982	33900	35232	37209	37573	39760	42829	43201	45131	48388
Prince George	23528	24010	24058	24635	26313	27838	30478	30015	30811	31445
Queen Anne	26851	27495	24771	26248	28013	29609	32042	32532	35697	26434
St. Mary	19935	22267	17794	17296	17481	18362	19475	19167	20321	21269
Somerset	12504	12941	12581	13567	14363	15448	18154	21087	21390	21505
Talbot	34068	35569	32699	33009	36077	38296	42209	46884	51356	55006
Washington	26378	25896	24716	25758	26506	27119	28774	29513	31155	32241
Wicomico	28472	30576	25973	27124	27485	28340	30282	31328	30490	31556
Worcester	30030	32712	31813	32136	34147	36421	41323	42714	45736	51598

Source: Annual Report of the State Board of Education of the State of Maryland and Maryland State Department of Education releases.

Appendix IV

Procedure for computing percentage change in the cost of housing for the local districts of the State of Maryland*
(data for Allegany County, Maryland, 1960 and 1970)

1. Given: A = contract rent in the local unit ($39 and $55)
   B = housing value in the local unit ($7900 and $11700)
   C = number of renters in the local unit (9741 and 9042)
   D = number of home owners in the local unit (16202 and 18815)
   E = state contract rent value, 1960 ($66)
   F = state contract rent value, 1970 ($110)
   G = state housing value, 1960 ($11900)
   H = state housing value, 1970 ($18800)

2. Compute the number of renters and home owners (1960 and 1970):

$C_{60} + D_{60} = 1960$ $\qquad$ $C_{70} + D_{70} = 1970$

$9741 + 16202 = 25943$ $\qquad$ $9042 + 18815 = 27857$

3. Compute percentage renters (1960 and 1970):

$C_{60}/(C_{60} + D_{60}) = I_{60}$ $\qquad$ $C_{70}/(C_{70} + D_{70}) = I_{70}$

$9741/25943 = .376$ $\qquad$ $9042/27857 = .325$

4. Compute percentage owners (1960 and 1970):

$1 - I_{60} = J_{60}$ $\qquad$ $1 - I_{70} = J_{70}$

$1 - .376 = .624$ $\qquad$ $1 - .325 = .675$

5. Weight local rent value by state rent value (1960 and 1970):

$A_{60}/E = K_{60}$ $\qquad$ $A_{70}/F = K_{70}$

$39/66 = .591$ $\qquad$ $55/110 = .500$

6. Weight local housing value by state housing value (1960 and 1970):

$B_{60}/G = L_{60}$ $\qquad$ $B_{70}/H = L_{70}$

$7900/11900 = .664$ $\qquad$ $11700/18800 = .622$

7. Compute county index (1960 and 1970):

$$(I_{60})(K_{60}) + (J_{60})(L_{60}) = M$$
$$(.376)(.591) + (.624)(.664) = .636552$$
$$(I_{70})(K_{70}) + (J_{70})(L_{70}) = N$$
$$(.325)(.500) + (.675)(.622) = .582350$$

8. Compute percentage change in housing costs (1960 and 1970):

$100(N/M - 1) = \text{percentage change}$

$100(.582/.637 - 1) = -8.4$

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*This procedure was suggested by Dr. Eugene P. McLoone, Associate Professor, University of Maryland as a way of determining differences in certain economic conditions in the metropolitan and non-metropolitan districts of the State of Maryland. An absolute answer to this question is probably not possible due to data limitations. It was reasoned, however, that since costs of housing and rents are main contributors to the development of the Consumer Price Index, this procedure would lend empirical weight to any attempt to determine an answer to the question of whether differences in economic conditions exist in metropolitan and non-metropolitan areas.

Appendix V

Data for computing the percentage change in the cost of housing in the 24 local districts of the State of Maryland (1960 and 1970)

School District	Contract rent 1960	Contract rent 1970	Housing value 1960	Housing value 1970	No. of renters 1960	No. of renters 1970	No. of home owners 1960	No. of home owners 1970
Allegany	$ 39	$ 55	$ 7900	$11700	9741	9042	16202	18815
Anne Arundel	71	115	12500	19500	13884	24013	37296	57087
Baltimore City	64	90	9000	10000	125929	160586	149668	128673
Baltimore	70	114	12500	17700	39519	55359	105037	129531
Calvert	39	71	9100	16500	1287	1410	2490	4130
Caroline	32	48	6500	10400	2015	1925	4015	4425
Carroll	43	75	11100	18900	4484	5856	9702	13767
Cecil	55	75	9800	14900	4429	4821	7601	9421
Charles	57	84	9800	21800	2589	3240	5151	8858
Dorchester	33	50	6600	10900	3560	3498	5481	6227
Frederick	47	77	10000	17700	7348	8604	12744	16322
Garrett	30	45	6000	10500	1488	1476	4032	4839
Harford	60	100	13000	21700	7969	10985	12388	21041
Howard	60	123	15800	28600	2493	3988	6966	12982
Kent	34	55	7200	12700	1605	1526	2994	3583
Montgomery	98	165	19800	32700	24648	60428	67785	96246
Prince George	86	143	15100	23700	34295	96351	60700	96612
Queen Anne	31	50	7300	13600	1840	1728	3061	4067
St. Mary	70	107	10400	18900	4263	5098	4652	7002
Somerset	26	41	5000	7900	1689	1459	4104	4486
Talbot	40	60	8900	16500	2560	2797	4208	5117
Washington	46	66	10200	15400	10961	12376	16239	20087
Wicomico	47	65	9000	13800	5163	5515	9477	11655
Worcester	32	47	6800	11200	2851	2658	4398	5211
Maryland	66	110	11900	18800	316610	484739	556391	680184

Source: Census of Housing (1960) and Census of Housing (1970), U.S. Depart-partment of Commerce/Bureau of Census.

Appendix VI

Percentage change in the cost of housing for school districts in the State of Maryland (1960 to 1970)

Allegany	- 8.4	Harford	+ 4.8
Anne Arundel	- 1.7	Howard	+17.0
Baltimore City	-19.3	Kent	+ 8.5
Baltimore	- 7.9	Montgomery	+ 1.9
Calvert	+16.1	Prince George's	- .1
Caroline	- 1.6	Queen Anne	+14.8
Carroll	+ 7.7	St. Mary	+ 3.0
Cecil	- 8.8	Somerset	- 1.0
Charles	+25.9	Talbot	+ 9.5
Dorchester	+ .3	Washington	- 7.2
Frederick	+ 8.0	Wicomico	- 7.2
Garrett	+ 6.7	Worcester	+ .3

Table of means, standard deviations and sample size for ANOVA table (p. 45) utilizing above data*

Treatment group	Metro-Districts	Non-metro Districts
Sample size	8	16
Mean	.0030	.0368
Standard deviation	.1077	.0989

*A test for homogeneity of variance yields an F = 1.17 (k = 2, n = 7 to 15) which is not significant at the .05 level.

Appendix VII

4611 Knox Road
College Park, Maryland
March 8, 1971

Mr. C. Clark Jones
Director of Personnel
Harford County Board of Education
Bel Air, Maryland

Dear Mr. Jones:

Enclosed you will find a brief statement of a problem I am attempting to investigate. As you will note the problem basically involves an analysis of economic indices, as represented by four wage criteria, and their relationship to teacher withdrawal in the state of Maryland. One of the wage criteria that I propose to utilize involves a comparison of salary schedules among districts competing for the same teacher supply.

My reason for writing, therefore, is to ask for information concerning those districts with which your school district competes for its teacher supply. It is understood that those districts may not lie contiguous to your district nor be part of the state of Maryland. Furthermore, it will not be necessary to rank order the districts in any fashion as this information is not integral to the study.

If you could return the enclosed response card identifying these competitive districts by April 1, 1971 it would be greatly appreciated. Thank you for your cooperation.

Very respectfully,

Jerome J. Ryscavage

Encl.

Appendix VIII

Maryland school districts and their competitor districts

School District	Competitor districts
Allegany	Washington, Frederick, Morgan Cty., W. Va., Mineral County, W. Va., Somerset Cty., Penna.
Anne Arundel	Prince George, Montgomery, Howard, Baltimore, Charles, Calvert, Baltimore City, Washington, D.C.
Baltimore City	Baltimore, Anne Arundel, Howard, Prince George, Montgomery
Baltimore	Baltimore City, Montgomery, Prince George, Harford, Anne Arundel
Calvert	Prince George, Charles, St. Mary
Caroline	Anne Arundel, Queen Anne, Talbot, Dorchester
Carroll	Howard, Baltimore, Harford, Frederick, Washington, D.C.
Cecil	Harford, Kent, Newark, Del., A.I. Dupont District, Del., Standton, Del.
Charles	Anne Arundel, Calvert, St. Mary
Dorchester	Caroline, Wicomico
Frederick	Washington, Carroll, Howard, Montgomery, Loudon County, Va.
Garrett	Allegany, Mineral County, W. Va., Preston County, W. Va.
Harford	Wicomico, Baltimore, Cecil, Carroll, Kent
Howard	Anne Arundel, Baltimore City, Carroll, Frederick, Prince George, Montgomery
Kent	Queen Anne, Cecil, Caroline, Talbot, Anne Arundel, Harford
Montgomery	Prince George, Baltimore, Washington, D.C., Fairfax, Va.
Prince George	Anne Arundel, Arlington, Va., Baltimore, Fairfax, Va., Montgomery, Washington, D.C.
Queen Anne	Kent, Anne Arundel, Talbot
St. Mary	Charles, Calvert, Prince George
Somerset	Wicomico, Worcester
Talbot	Wicomico, Kent, Queen Anne, Anne Arundel, Baltimore, Montgomery
Washington	Allegany, Frederick, Franklin County, Penna., Berkely County, W. Va., Jefferson County, W. Va.
Wicomico	Worcester, Talbot, Kent, Harford, Dorchester, Somerset
Worcester	Wicomico, Montgomery, Queen Anne, Talbot, Kent

Appendix IX

Test included in the NEA instrument for evaluating school district policies on teacher salaries

Test 1) Dollar amount of the minimum scheduled salary for the Bachelor's degree salary class.

Test 2) Dollar difference between scheduled minimum and step 11 of the Bachelor's degree salary class.

Test 3) Dollar amount of scheduled salary for the Master's degree salary class at step 11.

Test 4) Dollar differential between Bachelor's degree and Master's degree salary classes at step 11.

Test 5) Dollar amount of maximum scheduled salary for the highest preparation salary class not requiring an earned Doctor's degree.

Test 6) Ratio of the minimum scheduled salary for the Master's degree salary class to the minimum for the Bachelor's degree class.

Test 7) Ratio of the amount scheduled for the Master's degree salary class at step 11 to the minimum scheduled salary for the Bachelor's degree class.

Test 8) Ratio of the maximum scheduled salary for six years of preparation to the minimum scheduled salary for the Bachelor's degree class.

Test 9) Increments in the Master's degree salary class.

Test 10) Recognition of advanced preparation beyond the Bachelor's degree.

Appendix X

Local school districts and the applicable area wage survey*

School District	Area wage survey
Allegany	Charleston, W. Va.
Anne Arundel	Baltimore, Md.
Baltimore city	Baltimore, Md.
Baltimore	Baltimore, Md.
Calvert	Washington, D.C.
Caroline	Baltimore, Md.
Carroll	Baltimore, Md.
Cecil	Philadelphia, Pa.
Charles	Washington, D.C.
Dorchester	Norfolk, Va.
Frederick	York, Pa.
Garrett	Charleston, W. Va.
Harford	Baltimore, Md.
Howard	Baltimore, Md.
Kent	Philadelphia, Pa.
Montgomery	Washington, D.C.
Prince George's	Washington, D.C.
Queen Anne	Baltimore, Md.
St. Mary	Washington, D.C.
Somerset	Norfolk, Va.
Talbot	Baltimore, Md.
Washington	York, Pa.
Wicomico	Norfolk, Va.
Worcester	Norfolk, Va.

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*Area wage surveys are not done for each SMSA.

Appendix XI

Real property assessment level ratio by local unit

School District	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Allegany	.466	.466	.533	.533	.534	.534	.532	.532	.548	.548
Anne Arundel	.480	.480	.518	.518	.523	.523	.505	.505	.503	.503
Baltimore City	.640	.640	.606	.606	.602	.602	.580	.580	.584	.584
Baltimore	.561	.561	.543	.543	.559	.559	.555	.555	.559	.559
Calvert	.402	.402	.507	.507	.509	.509	.506	.506	.506	.506
Caroline	.507	.507	.512	.512	.528	.528	.501	.501	.530	.530
Carroll	.543	.543	.532	.532	.511	.511	.517	.517	.527	.527
Cecil	.436	.436	.530	.530	.532	.532	.507	.507	.523	.523
Charles	.427	.427	.530	.530	.515	.515	.501	.501	.520	.520
Dorchester	.517	.517	.527	.527	.531	.531	.517	.517	.507	.507
Frederick	.412	.412	.508	.508	.507	.507	.541	.541	.544	.544
Garrett	.462	.462	.509	.509	.514	.514	.480	.480	.482	.482
Harford	.439	.439	.526	.526	.539	.539	.521	.521	.524	.524
Howard	.554	.554	.534	.534	.561	.561	.556	.556	.551	.551
Kent	.435	.435	.497	.497	.530	.530	.515	.515	.505	.505
Montgomery	.522	.522	.516	.516	.534	.534	.535	.535	.538	.538
Prince George	.498	.498	.527	.527	.532	.532	.531	.531	.536	.536
Queen Anne	.444	.444	.513	.513	.505	.505	.500	.500	.513	.513
St. Mary	.400	.400	.502	.502	.507	.507	.490	.490	.504	.504
Somerset	.496	.496	.537	.537	.539	.539	.512	.512	.532	.532
Talbot	.439	.439	.506	.506	.506	.506	.483	.483	.500	.500
Washington	.513	.513	.550	.550	.551	.551	.537	.537	.539	.539
Wicomico	.430	.430	.523	.523	.538	.538	.538	.538	.548	.548
Worcester	.519	.519	.536	.536	.522	.522	.507	.507	.501	.501

Source: 27th Biennial Report of the State Department of Assessments and Taxation, January, 1969, p. 16.

Appendix XII

Coding of the variables

1) Withdrawal rate (columns 5-8).

2) Cost of living (columns 9-26).

   Average salary (t - 1) - columns 9-13.
   Average salary (t) - columns 14-18.
   Consumer Price Index (t - 1) - columns 19-22.
   Consumer Price Index (t) - columns 23-26.

3) Intra-comparability (columns 27-32).

   District under investigation score - columns 19-22.
   Prime competitor district score - columns 30-32

4) Inter-comparability (columns 33-50).

   Weighted index of average earnings (t - 1) - columns 33-36.
   Weighted index of average earnings (t) - columns 37-40.
   Average salary (t - 1) - columns 41-45
   Average salary (t) - columns 46-50.

5) Ability to pay (columns 51-58).

   Local revenue raised per pupil belonging - columns 51-53.
   True valuation per pupil belonging - columns 54-58.

6) Year (columns 59-68).

   Coded "1" if the year was 1960-61, otherwise "0" (column 59).
   Coded "1" if the year was 1961-62, otherwise "0" (column 60).
   Coded "1" if the year was 1962-63, otherwise "0" (column 61).
   Coded "1" if the year was 1963-64, otherwise "0" (column 62).
   Coded "1" if the year was 1964-65, otherwise "0" (column 63).
   Coded "1" if the year was 1965-66, otherwise "0" (column 64).
   Coded "1" if the year was 1966-67, otherwise "0" (column 65).
   Coded "1" if the year was 1967-68, otherwise "0" (column 66).
   Coded "1" if the year was 1968-69, otherwise "0" (column 67).
   Coded "1" if the year was 1969-70, otherwise "0" (column 68).

7) Type of district (columns 69-70).

   Coded "1" if the district is metropolitan, otherwise "0" (column 69).

   Coded "1" if the district is non-metropolitan, otherwise "0" (column 70).

*Columns 1-4 are used for identification purposes.

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